

SINCLAIR

JULY 1991 £1.95



*Hardware  
review*

**Real Time  
Digitizer**

QL IN THE

1990s!

HELP  
us plan  
for the  
future –

SEE OUR  
GIANT  
JOINT  
QUESTIONNAIRE

*New  
User  
Guide*





# DJC

## Dilwyn Jones Computing

41 Bro Emrys, Tal-y-Bont,  
Bangor, Gwynedd LL57 3YT  
Tel: Bangor (0248) 354023

**THE GOPHER** by Norman Dunbar £12.00  
NEW!!! Give this program a text string and it will hunt through a disk, cartridge, or hard disk, reporting files that contain references to that string. Many options for the search can be set. Find lost files! (128K)

**SUPER DISC INDEX** by Imre Dominik £12.00  
New!!! Catalogue your floppy discs and cartridges in one master database. Print lists of files, sorted by filename or disc number. Plus, if you tell it a filename (exact or vague) it will search the database for that name and tell you on which disc (or discs) it lies. This is the ideal way to get your media organised - no more hunting through endless piles of discs to find that file or program you knew was there somewhere. Can handle thousands of files, on up to 999 media. (256K)

### DI-REN PRODUCTS

SPACE IS LIMITED, SO WE CAN ONLY LIST THE PRICES HERE. FOR FURTHER DETAILS SEND US A SAE FOR THE DI-REN LIST. PLEASE ADD £2.50 POSTAGE FOR FLEET TACTICAL COMMAND SOFTWARE OR MINI PROCESS CONTROLLER HARDWARE.

**FLEET TACTICAL COMMAND II**  
Real time, interactive 3D naval wartime scenario simulation for 2 networked or modem linked QL's.

3.5" disk version £49.95  
MDV version £56.95  
FTC data print utility £9.95

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Limited stocks of version 1 copies  
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MDV version £32.95  
THE FUGITIVE text adventure £9.95

**MINI PROCESS CONTROLLER**  
low cost QL switchgear unit, 6 relay switches, fits in line with printer from serial port. Use your QL to control external equipment £59.95  
**MINI PROCESS CONTROLLER UTILITY**  
program to help control your MPC £9.95  
**QL NETWORK PROVER** indicator for the QL network system, just plugs in £3.50

**QUESTION MASTER** by C.B. Storey £10.00  
Quiz system, use for revision or personal amusement. (128K) Create your own quizzes, or try these:-  
General knowledge quiz questions £5.00  
Classical music quiz questions £5.00

**SCREEN ECONOMISER** by G. Estournet £10.00  
Protect your monitor's screen - turns off the QL screen display if no key is pressed for a set number of minutes. 128K.

**TRANS 24** by Ralph Reköndt £10.00  
9 pin to 24 pin printer graphics dump conversion, eg for Page Designer 2.

**WINBACK** by Norman Dunbar £25.00  
Hard disk backup utility for Miracle Systems hard disk. Need Toolkit 2 to run.

**POLYTEXT** by Nick Ward £16.00  
Multi column NLQ output from Quill. Rearranges the output into columns, SAE for a sample printout 128K

**QL GENEALOGIST** by Chris Boutal £19.50  
Record and print your family tree with this comprehensive genealogy database. See the review in QL World Jan. 1991. Specify 128k or expanded version.

**HOME BUDGET** by Joe Hafke £20.00  
Personal tax calculator (UK only plus domestic bills and accounts budgeting system. Suitable for 128K QL.

**VISION MIXER** by Dilwyn Jones  
Screen display and advertising utility. See review in QL World January 1991!

**VISION MIXER PLUS** by Joe Hafke  
A new, enhanced version of the popular Vision Mixer software. More features and even easier to use.

**PICTUREMASTER** by Joe Hafke  
Screen making utility for use with both Vision Mixers. Text captions, graphics, mode 4 & mode 8 colours, etc (NB - all 3 programs need min. 256k RAM)

VISION MIXER PLUS (disc only) £22.50  
PICTUREMASTER (disc only) £15.00  
Both together - save 20%! £30.00  
VISION MIXER 1 (disc only) £10.00  
Upgrade Vision Mixer 1 to Vision Mixer Plus (quote serial number) £14.50  
PICTUREMASTER + upgrade £24.00

**QUICK POSTERS** by Dilwyn Jones £10.00  
Make text posters quickly and effortlessly with this program. Intended mainly for Star printers, so check compatibility with us first! 128K

**BASIC REPORTER** by Dilwyn Jones £10.00  
BASIC programming aid. Lists names used, line numbers, extensions etc and Helps you debug and develop BASIC programs. Works on unexpanded QL.

**SUPER DISC LABELLER** £10.00  
Label your floppy discs quickly and neatly, listing filenames in columns, adding text. Optional sorting Reconfigurable printer driver. 128K

**COCKTAILS WAITER** by Imre Dominik £10.00

Cocktail drinks recipes database. Over 400 recipes supplied with the program. Great for parties, or for when you have guests or friends around! Browse through the database, find drinks you can make with a given ingredient, browse through the database, print it, add to it, many facilities (128K)

**EXTRA RECIPE SETS, 2 SETS AVAILABLE**  
MIX2 - around 400 extra recipes £5.00  
MIX3 - includes non-alcoholic £5.00

**DISCOVER** by Dave Walker £20.00  
QDOS to PC disc format transfer. 256k, disc only. SAE for details. Copies QL disks to PC format disks and vice versa.

**MULTI DISCOVER** by Dave Walker £30.00  
As Discover, but also transfers to BBC DFS/ADFS, CPM (many formats) and to Unix CP10 format. 256k, disc only

**TEXTIDY** by Dave Walker £15.00  
Text file conversion utility. Convert Quill .doc files to plain text for other QL text editors, or use with Discover, to transfer to a PC for DOS Quill format, to Wordstar (PC) and vice versa. Also converts Archive screen files to DOS format for transfer to PC Archive. Available on disc only.

**TASKMASTER** by Peter Jefferies £25.00  
Multitasking front end utility, calculator, notepad, printer buffer etc. Easy to use multitasking system for QL.

**FILES 2** by Peter Jefferies £12.00  
Enhanced version of Taskmaster files utility - add to Taskmaster or use by itself. View/copy/delete/etc files. Comprehensive facilities and easy to use. Suitable for use on unexpanded QL  
**SPELLBOUND** by Peter Jefferies £30.00  
30,000 word dictionary, check spelling as you type, expandable dictionary  
**SPELLBOUND SPECIAL EDITION** £50.00

New version of Spellbound, larger dictionary, retrospective spell-check, turns itself back on automatically at the start of new words.

**UPGRADE SPELLBOUND TO SPELLBOUND S.E.**

Return Spellbound master plus £30.00 (NB Spellbound S.E. is on disc only)

**FLASHBACK** by Peter Jefferies £25.00  
Excellent fast, versatile database.

**FLASHBACK SPECIAL EDITION** £40.00  
Enhanced version of Flashback - new commands, report generator, mailmerge, label printing etc.

NB - apart from Files 2, all the Peter Jefferies software requires expanded memory to run.

### SUNDRY COMPUTER SUPPLIES

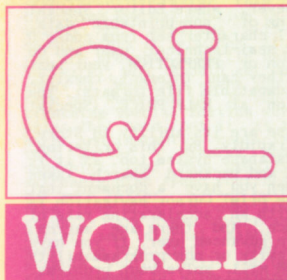
3.5" DSDD unbranded discs, with labels	£0.50 each	3.5" Sony branded discs with labels	£1.00 each
20 or more unbranded discs	£0.45 each	Pack of 10 £9.50, 2 packs or more	£9.00 each
5.25" unbranded DSDD 80 track discs	£0.35 each	New Sinclair microdrive cartridges	£2.50 each
Disc labels, roll of 100	£2.00	Labels for microdrive cartridges	£2.00 /100
Disc labels, 100 on printer feed roll	£2.50	Address labels, on printer feed backing	£2.00 /100
40x3.5" disc storage box (lockable)	£5.00	80x3.5" disc storage box (lockable)	£7.00
10x3.5" disc storage box (Ryford)	£1.20	Monitor stands, up to 14", tilt and swivel	£15.50

Printer ribbons - we can obtain most types. If your type is not shown, ask and we may be able to order it for you. LC24-10, LC10, Citizen 120D, Brother HR5/M1009 etc, Centronics GLP/GLP2, Epson FX/RX/MX80 etc, PW1080/Kaga Taxan KP810, Juki 6100, Shinwa CP80 and many more normally held in stock, prices from £4.00 each. If you are only ordering ribbons, please ignore the postage charge shown below and add £0.50 per ribbon for postage and packing in UK, £1.00 abroad.

TERMS - Postage - UK, add £2.50 postage and packing, except to software only orders, which are post free. EC countries - please add £3.50 postage and packing, except to software only orders, to which you should add £1.00 per item for postage. Other countries - add postage at cost, and remember airmail is more expensive than surface mail. If in doubt, add 10% to order value, minimum £3.50 abroad. Please make payment, in Sterling only please (your bank can tell you how to send Sterling from abroad, for example by Eurocheque, payable to DILWYN JONES COMPUTING. We regret that we are not yet able to offer credit card payment facilities, but may be able to arrange Cash On Delivery terms in the UK only, for a small charge, if required (please enquire if you do require this service). Goods remain the property of Dilwyn Jones Computing until paid for in full. Send an SAE for further details of the program or progress you are interested in and a full price list.



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ISSN 026806X

Unfortunately, we are no longer able to answer enquiries made by telephone. If you have any comments or difficulties, please write the The Editor, Open Channel, Trouble Shooter, or P'sion Solutions. We will do our best to deal with your problem in the magazine, though we cannot guarantee individual replies.

Back issues are available from the publisher price £2 U.K., £2.75 Europe. Overseas rates on request.  
Published by Maxwell Specialist Magazines, A Division of MCPC Ltd., Sinclair QL World is distributed by IPC Market force, King's Reach Tower, Stamford Street, London SE1 9LS.  
Subscription information from: MSM Subscription Dept, Lazahold Ltd., PO Box 10, Roper St, Pallion Ind. Est., Sunderland SR4 4SN. Tel: 091 510 2290  
UK: £21.00, Europe: £32.00, Rest of the World: £38.00.

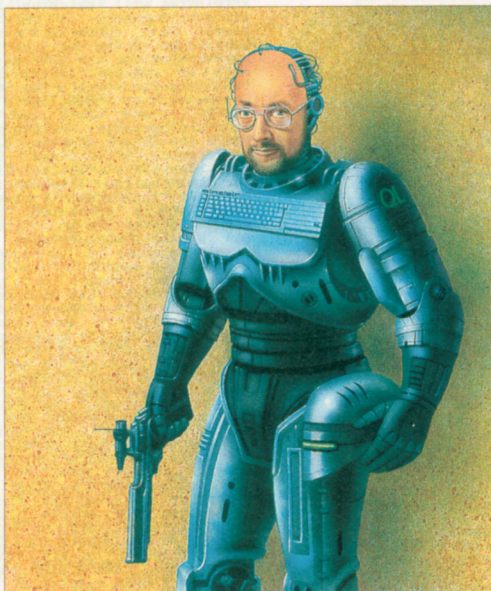
Typesetting by Ford Graphics, 8-10 Whitsbury Road, Fordingbridge, Hampshire. SF6 1BR. Tel: (0425) 655657  
Printing by Cradley Print. (0384) 411411  
Sinclair QL World is published on the third Thursday preceding cover date.

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SINCLAIR QL WORLD - 1991

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## NEXT MONTH

### ALTERNATIVES TO ARCHIVE

Mike Edwards assesses Flashback and DataDesign from a personal point of view

### DBQL

We continue with Tom Ashcroft's simple relational database.





Not just a word-processor - this one is THE word processor. From the same inspired team who brought you classics like LIGHTNING SPECIAL EDITION and PC CONQUEROR, Digital Precision presents a product that will revolutionise the way you use your QL. Let us tell you how PERFECTION will do this.

Several hundred thousand QL users have grown familiar with the free word processor that was bundled with the QL. On the plus side, its use could be mastered in a few minutes thanks to its simple menu system and its reasonably WYSIWYG (What you see is what you get) in appearance. On the minus side, it is very slow, sometimes idiosyncratic (in what it prevents you from doing, or the roundabout way in which it forces you to go about things that should have been straightforward) and very many commands that we think should have been provided with it simply weren't. Valiant attempts to accelerate it by 'patching' it have achieved only a 20% speedup.

There is, however, no getting away from the fact that the majority of QL owners still use Quill as their main program. They have grown used to the user interface of the bundled programs, and are reluctant to invest time in learning some totally incompatible system, whatever its claimed advantages might be. So - using their ingenuity for QL people are an ingenious tribe - users have put up with the inadequacies and slowness, and enjoyed Quill's friendliness.

You are probably just such a QL user yourself.... Now here is a product CREATED JUST FOR YOU.

A word processor that you can master in just a couple of minutes. A word processor whose user interface uses precisely those keys that you would expect it from intuition or experience - to use. A word processor that is menu-driven (multiple page menus) so there is absolutely no need for you to remember anything or ever refer to the manual; the menu is on the screen all the time. A word processor that is intuitively obvious to operate; even more obvious than was the bundled one. If you have become at all used to the F3 interface, you will love this enhancement. A word processor that is designed for Absolute Beginners and Advanced Users, for Complete Wallies and for Albert Einsteins alike.

A word processor that is delightful to use for letters and documents of but a few pages as well as for articles, journals, magazines, books, theses or manuscripts hundreds of pages long. A word processor that can unleash the power of your printer, whatever its make, and squeeze the very best from it. A word processor with a very flexible user-configurable printer driver: one, however, that you should never have need to configure(!), as it works as shipped with Epson-compatibles and most non-compatibles, and if you have an esoteric printer, it can utilise your existing configured Quill printer data file, automatically, if you want it to! With this word processor you do not have to buy any extra printer drivers - you get everything you need right from the start.

A word processor with full on-screen indication of character mode - bold (i.e. emphasised) appears bold on screen, underline appears underlined, italics appear in italics, superscript and subscript appear superscripted and subscripted.... Other 'special' type modes - dependent on the capabilities of your printer, like switching fonts, pitches, NLQ/draft mode, proportionally, double-like, or anything else you choose - are indicated on screen by variations in ink/strip colour combinations, just as the most advanced PC word processors do. You can even make up your own 'attributes' to be displayed on-screen in a particular ink/strip. Combinations of attributes are permitted - the display copes fine. Never before have things been so clear and simple....

That PERFECTION manages to do all this is remarkable. That it manages to do it at all fast would be amazing. But the truth is, in fact, much much better. PERFECTION is by far the fastest word processor for the QL, being DOZENS of times faster than Quill on many operations (a minimum of five times faster than it on everything), and - yes - many times the speed of our own beloved and excellent Editor, and far far ahead of all the others.

This may seem impossible to you. Two years ago, before we started work on PERFECTION, it would have seemed impossible to us as well! But a remarkable bit of software technology has enabled us to achieve this incredible acceleration. Of course you don't need to know or understand how we have accomplished all this in order to enjoy to the full the benefits of PERFECTION speed. If you want to know anyway, look at the technical section later on.

If you already use Quill or ANY OTHER QL WORD-PROCESSOR, you will be overjoyed to know that PERFECTION can load your existing saved files (.doc or .lis or ASCII) directly, with no conversion process required. This - together with the automatic reading of existing printer driver data - takes all the trauma out of the move to an exciting new system. And PERFECTION files are usable with PC/ST/Amiga word processors too.

PERFECTION comes with a multi-function configurator that allows you - if you want - to tailor-make a version specific to your tastes. Practically everything that is settable at run-time is also pre-configurable, making PERFECTION comfortable to operate. As you become more familiar with PERFECTION and no longer need the menu options to be visible all the time, you can toggle the menu off, freeing all the screen for your document. You can configure PERFECTION so that on startup the menu is either visible or not. As you become even more familiar with PERFECTION, you can opt to bypass the menu system entirely and use alternative direct keypress commands to access PERFECTION's power even more rapidly.

PERFECTION natively multitasks (of course) which means that without any other tools you can run multiple copies of it simultaneously, as well as run it at the same time as other pieces of software. Even if you choose to run only one copy of the program, you still have the option to look at more than one part of the document at the same time. You can take a snapshot of part of the document, and keep that snapshot in view as you edit a totally different area of the document. Ideal for indexing or cross-referencing. You can set up macros so that making a glossary is easy. Also, you can have any number of blocks - not just one - defined in the document. You can undo/edit attribute changes with a single keypress - there's no need to laboriously 'paint' over areas or navigate to the start and end of a highlighted area in order to adjust the attribute! Being able to cope with human error is an important part of PERFECTION philosophy. For example, not only is there an Undo option, but you can also ESCAPE from any command. When you have right justification on PERFECTION will add pseudo-spaces to pad out the line. Pseudo-spaces look like spaces and print like spaces but when you left justify they are removed while real spaces - the ones you have entered (via the SPACE bar or TAB) are not. This means if you accidentally right-justify tabular or columnar data a simple left-justify will get it back to its exact original state. Most other word processors do not distinguish between spaces you have entered and spaces they have inserted, and hence cannot auto-recover.

Many users need the use (sic) of a spelling checker with their word processor. Adequate spelling checkers already exist for the QL, and for users who either do not want a spelling checker or who do not want one as yet, or who already have one and are on a tight budget, we supply a version of PERFECTION without any built-in checker. But to get the best out of PERFECTION, we also supply it bundled with a dedicated Spelling checker of unsurpassed speed. There are even two levels of dictionary supplied (you get both) - the larger one is 225,000 words (no more hassle of having a checker which doesn't know the words you use: this dictionary is about 400% larger than its nearest competitor!) and a compact one: use the latter if you are short of memory, or when your document is really huge. You can add new words to the dictionary as well as create new dictionaries. With either dictionary PERFECTION PLUS one checks as you type, or checks saved files, or - BEST OF ALL - spell-checks interactively from any one point in the document to another.

If you already have our Editor Special Edition and use it for documents database work or programming, you will find PERFECTION a wonderful treat. PERFECTION's WYSIWYG behaviour, greatly enhanced document facilities ('tells you everything' status line, available word/line/character counts, regular and forced page breaks, headers and footers), menu-driven options and VERY MUCH

GREATER SPEED make it an ideal upgrade. There are hundreds of detailed changes to give you one: paragraphs do not need to have a blank line between them in order to distinguish them any more. There remains an area, however, where Editor Special Edition remains supreme - the editing of 'non-printable' data, the ability to handle the entire ASCII character set from codes 0 to 255. So if you are a technical or semi-technical user and do not have either Editor Special Edition or PERFECTION, your best buy is the two programs together (they can interact, coexist, work simultaneously and have fully-compatible file formats). You will then get Editor Special Edition at HALF PRICE (Special Offer - limited duration).

The characteristics of a good database are its ability to Store, Retrieve and Manipulate information rapidly. By this criterion, this word processor makes an ideal database system too, as it is blindingly fast and flexible. Forward and backward 'Search' takes at most a couple of seconds, even when you have a document that fills an 896K Truampcard system to the brim! Cursor navigation is also unbelievably fast and smooth, with an accelerating rate of scrolling if you indicate impatience. And there are macros, programmability and more for the more advanced user. If you have been unhappy with the speed or complexity or non-programmability of your existing database, PERFECTION will solve your problems. PERFECTION can even access your existing Archive export files. And if you want full desktop publishing capabilities (the use of fonts that your printer does not possess, and graphics) interlinking PERFECTION with Professional Publisher is a doddle. Use PERFECTION for creating, editing and manipulating, and 'pour' the result into Pro Publisher. PERFECTION is a user-friendly, familiar user-interface, stand-alone WYSIWYG dual-control (menus or direct commands) word processor of enormous power and blistering speed, which (for the first time) makes output to printers hassle-free. There is nothing else like it or even remotely as good as it on the QL or on anything else. PERFECTION is our best yet. If you have PERFECTION is for you, whether you have your existing word processor or are indifferent to it or love it. PERFECTION will let you forget about all the technology and concentrate only on the writing.

PERFECTION costs just £79.95 including integrated printer drivers, ancillary programs and jargon-free, friendly but to-the-point documentation (that you will probably never need to read through!). PERFECTION PLUS comprises PERFECTION plus the dedicated Spelling checker with dictionaries and costs just £119.95.

**TECHNICAL INFORMATION ON PERFECTION**

You don't actually need to read or understand this. PERFECTION gets its superb speed from two sources. Firstly, PERFECTION - unlike virtually any other word processor - is written entirely in 100% hand-written machine code. This gives us a considerable speed advantage over compiled alternatives. Had we written PERFECTION in a high level language it would have been 4 times slower, 6 times bulkier and taken us a great deal less time to produce. You reap all the benefits of our hard work.

The other source is design. There are two formats for internal data storage for character handling programs. Many store data serially, in a long string of characters. Ones like Editor store data as lines scattered through RAM, with a table of pointers to the lines - a far more advanced method. The first format has the advantage that it is cheap to program - the user pays the cost in terms of performance, with sluggish block-defining/moving, navigation and insertion. The second format has advantages including instant random access to any line and quick insertions and deletions - the disadvantages may include heap fragmentation that will result from repeated grabbing of small chunks of space (garbage collection may be required periodically if space is short). Both formats share the disadvantage that 'global' changes made to a part of the document - say a switch to bold at the top - will take a long time to filter down through the system to become visible on-screen at lines at the bottom.

PERFECTION uses a variant of the second format that does not have its disadvantages. Data is stored in RAM in optimally-sized chunks - a chunk being roughly the size of several screens. Each chunk has a control information area within it about the number of lines etc within it, the display status at the start of it (say bold on italics/underline etc off). Whenever you are editing, the relevant chunk(s) are instantly loaded into a large area that has slack space at both top and bottom. That means that you can add or delete a great amount of data instantly, without PERFECTION having to bother about updating anything but the work area. Only when you move over the edge of the work area will PERFECTION need to housekeep outside the work area: the housekeeping itself is then very very fast, as only control information areas need to be updated. There is no need for a speed area that has slack space at both top and bottom. 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## LIGHTNING SPECIAL EDITION LIGHTNING

Until the autumn of 1989 the fastest way of speeding up your QL display was to buy **Lightning**, which greatly accelerated QL text printing, graphics and maths, without affecting compatibility at all. Now you can buy **Lightning Special Edition**, which is significantly faster than **Lightning** and does a lot more! **Lightning Special Edition** is simplicity itself to use. Once it is loaded ALL programs will AUTOMATICALLY benefit from the enhancements it provides. If you are using a QL without **Lightning** you are probably a little pale (quote from John Norton of Sector Software), you should get out and about more... Go to some QL shows or meetings where you will see **Lightning** in action - or take our word for it. If you don't have **Lightning** you are WRONG. **Lightning Special Edition** works by automatically (I know we keep using the word, but it is the only one that is really correct here) and instantly replacing QL ROM code (or Minerva code, for that matter) Minerva and **Lightning** complement each other superbly that has been optimised for space, with extremely high speed routines written by us that do the same job but much faster. Screen output speed gets accelerated by factors from over 1.5x to over 10x (about 2x-4x is representative), graphics are drawn twice as fast (points are plotted 5 times faster) and internal maths is speeded up by 2x-5x (you can vary the precision). There is virtually no cost in RAM (for example you can still run Quill with a fairly large document on an unexpanded QL with **Lightning Special Edition**). The Special Edition is supplied on EPROM plus disk/cartridge: if you already have something precious plugged into the QL's EPROM socket (at the rear), there is no problem - all the EPROM's functionality is duplicated on the other medium! **Lightning Special Edition** provides more than acceleration - you can dynamically adjust channel parameters like ink, paper, font, screen position use over 80 fonts, a null device, a character drain and all sorts of other interesting gadgets. **Lightning Special Edition** installation has been totally automated, and will not present you with complications no matter how computer-naïve you are. If you cannot afford the Special Edition, get **Lightning**. Refer to its review in the 1988 QL World to see how effectively **Lightning** acquitted itself. Both of these programs transform the QL into an altogether more zippy, business-like, efficient, enjoyable machine.

## PC CONQUEROR WITH DR-DOS v5.0 PC CONQUEROR

Terrific though we know the QL to be, we do feel the pressure to be "PC compatible" in today's world. There is increasing demand to be able to bring home and run the programs we use at work (or the other way around), and to have access to the vast storehouse of PC software, databases, spreadsheets, expert systems, expert systems, accounts and financial modelling packages, vertical market applications, visualisation aids, graphics/CAD/PCB designers, languages/compilers, operating systems, environments, utilities, adventures - you name it, there are scores of each type readily available for the PC. And thousands of shareware/PD programs too, most for the cost of a blank disk plus postage. If you buy **PC Conqueror**, you are virtually no cost in RAM (for boot up **PC Conqueror** takes 10 seconds from the F1/P2 prompt; thereafter, your QL is a HIGHLY compatible PC clone (indeed, more compatible than some "real" PCs). **Conqueror** is all-software. There is no comparison in quality between **Conqueror** and its predecessor: **Conqueror** has ALL the features of **Solution** (read the details later in this ad if you are unfamiliar with **Solution**'s legion facilities) and adds TWICE as fast; this has come about by our careful rewriting and optimising of **Solution**'s code. As if the colossal speedup was not "enough", **Conqueror** (unlike **Solution**) runs perfectly even with PC software that makes various "non-legal" calls to the PC operating system. **Conqueror** runs with virtually anything that will run on a PC: QL Worlds from December 1989 to March 1990 listed several hundred PC programs/utilities found to work with **Conqueror**. It is simple to say that it works, yet to find a program that runs fine on a standard PC that doesn't run with **Conqueror**: we are aware, however, of programs that will run with **Conqueror** but won't run on some PCs! Because in **Conqueror** we've cracked the problem of detecting when the PC screen has been changed, we need not slavishly update the screen many times a second (taking precious time away from the main PC-emulation), as did **Solution**. Instead, we update the screen instantly it needs to be updated. This simple to understand but very hard to implement modification gives **Conqueror** additional (over and above what we've already discussed), "tunable" acceleration, as well as absolutely smooth echoing of keyboard input to screen (**Solution** could be a bit jerky when you typed quickly). **Conqueror**'s new features include a more flexible configurator and a better diagnostic and supervisor option, an enlarged manual (**Conqueror** itself is more compact!) with a troubleshooting chart, and a new mode of operation (in addition to the "normal" one of reading/writing PC disks directly) which allows you to create mini PC environments - you select the size, location and name - on any QL device (including floppy, ramdisk, hard disk and even **mdv**) which look like files from QDOS (and can therefore be copied with SuperBASIC's COPY but not indistinguishably with PC drives from within DOS (**Conqueror** works with all versions of DOS). If you do not have legal access to a copy of DOS, you need to buy DOS too (DR-DOS or MS-DOS) - but we sell the complete DR-DOS (with Viewmax, Shell, Cache and all system utilities) at a 1/2 price! Of course QLS are better than PCs - but QLS that are PCs as well are better still. We will leave such a last word to people who have already bought **Conqueror**. All these sentiments are unsolicited. "I wish to congratulate you on the excellent work you have done on **Conqueror**. The improvements in performance over **Solution** are astounding. Well done!" B.C. Papegajij, Netherlands. "I am highly delighted with this new emulator. (Apart from the speed-up) it also appears to be more tolerant." L. Chandler, Peterborough. "Congratulations on bringing such a fast PC emulator into the world - on it even Wordperfect runs at a reasonable speed." R. Williams, London. "I'm impressed with the improvement in speed over **Solution**." P. Vervoort, Netherlands. "Thank you for your prompt service. I have **Conqueror** up and running, and congratulate you on an excellent piece of software." G. Leagas, Hartlepool. "On some benchmarks almost as fast as a PC." P. Johnson, Stoke on Trent. "Conqueror is still a whole lot faster (even) without **Lightning** than **Solution** is with the assistance of **Lightning**." P. Christie, Glasgow, who went on to praise **Conqueror** for running software **Solution** couldn't handle. "Conqueror, to which I upgraded from **Solution**, is a delight to use by comparison!" B. Gouldwell, Dunipace. V. Pakanen, Finland sums it all up rather well with - simply - "Excellent."

## PROFESSIONAL PUBLISHER

To show you a little of what our Professional Publisher can do, we have prepared our last advertisement using it. Notice from our May 1990 advertisement how we can wrap the result around graphics or in fact anything, of any shape. When we wrote Professional Publisher (PP), we knew it was a very special sort of program. PP can produce pages of quality - virtually indistinguishable from those prepared on professional typesetting kit, the only limiting factor might be your printer; however, while the very best output from PP will be obtained from 24 pin models and lasers, you will be stunned by what PP can squeeze out of the humblest 9-pin machine. Great care was taken in the design of PP so we were absolutely sure that no actual knowledge of, or practice with, desktop publishers was required in order to use it (the Professional in "Professional Publisher" refers to the output quality, not the level of operating skill required. When you use PP, you will notice that at each and every stage a menu is available (there are getting on for a hundred menus in total) with a list of options selected by using either the cursor keys and SPACE bar, or by pressing a digit key - use what suits you!

experienced with the program, you may select Command mode (using the Enter key) and choose operations directly, bypassing the menu system. PP is more user-friendly than any page-making program we have ever seen on any computer, period. Let us talk you through how you might choose to produce a page or succession of pages. This is just one way you might proceed: PP does not impose any sequence of steps upon you, and you can omit certain operations altogether. You will have pre-configured PP to boot up with a generous lot of fonts (you select which ones you are likely to want - of course you can load in additional ones, or discard existing ones, at run-time too). You could then set the required page dimensions and orientation, as well as not-necessarily-symmetric margin, grid, gutter, column and navigation-guide positions, as well as half the PP textual is a glossary) you could have pre-configured PP for these too, or loaded in alternative layouts (layouts are distinct from page contents) you've created in previous sessions. If you don't set layout we'll use the default, or the one used for the previous page. Now you would plan the page in detail. Laying out graphics (if any) comes next - you can create these in PP itself with its superb rubber-banding, dozens of brushes, palettes, texture-fills and so on. Alternatively you can load in screens created elsewhere, including Eye-Q, Easel, any other graphics programs or digitiser, into a cut and paste buffer where a dozen tricks (including resizing, slanting, scrolling and texturing) are available, and then take the finished product onto the page. This done, you might insert headlines or captions, selecting from the choice of fonts available by describing as stunning! You can do this in billions of ways (yes, we mean thousands of millions) to give but two examples, you have a choice of 32 slopes for italics for the font, and dozens of aspect ratios are selectable. Now you might opt to get the main body or bodies of text down on the page. As fonts are defined to great accuracy (upto 2304 pixels PER CHARACTER!) jaggedness is a thing of the past, and visually the choice of fonts can only be described as stunning! You can do this either by directly typing it into cursor-dragged boxes (with all the options you would expect from a dtp system, and a few more besides), or by loading it in from file created by Quill, PERFECTION, Editor or other word-processor. The latter method is better (because you retain the text as a character stream rather than as pixels when you save the file). Highlights such as bold, underline or font face which you may wish to apply to the text are preserved. Indeed you can control PP's operation from within the text file itself. If you are an advanced user, you can even teach PP your own mnemonics, so that it switches between different styles and modes as it encounters instructions you put into your text file when you created it! The imported text file is editable within PP. It is up to you to decide where the text is to lie - PP places no restrictions on other than the shape of the windows into which the text is to flow; they need not be rectangular, and can have any irregular border, and can even overlap or be contained one inside another! You can freehand-draw (there's excellent rubber-banding to help you) the window borders as you choose, to get any effect you desire, to fill any space you wish and to avoid any existing material already on the page (or to reserve room for new material). Amazingly, within the window the text will all be perfectly micro-justified in the font(s) of your choice, however bent or contorted you made the border. Text will flow automatically from one window to the next either until you have run out of text or out of windows. There are many text formatting facilities: you can select word-wrapped, force-broken or hyphenated, and you can specify minimum numbers of pre-hyphen and post-hyphen characters so that absurd hyphenations are avoided (if no sensible hyphenation position can be found the word is wrapped instead). There are so many fine-tuning controls here that the rest of this ad could be devoted to describing them and would still leave things out! We will have to content ourselves with but one example: with micro-justification (pixel by pixel spacing, not crude character by character stuff) we even allow you to specify what % of padding space is to be allocated between characters and how much between words! Text work completed, you can then put in the final touches by adding borders, shadows, patterns or designs, overwriting or slipping under or combining these with existing material, repositioning parts of the page if necessary. The end result - be it for a letter, letterhead, document, manual, article, newsletter, magazine, book, thesis, ad - is far better than you have any right to expect from a piece of software costing under £2,500, let alone under £1000...

## PROFESSIONAL PUBLISHER TOOLBOX

NEW!

For Professional Publisher users - this useful addition not only supplies several man years worth of beautiful high definition fonts - including familiar types like Roman and Universal - but also contains many smaller fonts, more clipart and programs to load Sector Software clipart, filter text before importing into Professional Publisher, save parts of Professional Publisher pages as screens (for importing into any graphic program - like Eye-Q - or manipulating via SuperBASIC) etc. Excellent value.

## FONT ENLARGER

For Professional Publisher users - loads of large fonts are automatically created by this multitasking utility, as and when you need them (or in advance), by enlarging existing smaller fonts from PP itself and from **Lightning Special Edition** and hordes of other sources: with this there is NO jaggedness at all. A font editor for small and large (hdf) fonts is included.

## GRAPHX

Scaleable output for all our desktop publishers on 9- and 24- pin printers: a useful alternative to the built-in drivers.

## EYE-Q

There is no way to describe Eye-Q except as the best graphics program for the QL. This master is now four years old, and we have never felt the need to change anything. Its use is characterised by absolute simplicity, speed and power - it has that indefinable precision "feel" that is just right. All the expected manipulations are provided. Whether your needs are technical drawing, labelling, design, illustration, freehand work, copying - or just having fun, Eye-Q will not disappoint. Of course it is menu driven with context-sensitive help. The system takes 5 minutes to learn. The variable zoom and fill facilities, anti-aliasing measures, cursor acceleration and so on make Eye-Q a classic in its own time.

## ULTRAPRINT

To get the best printer output from Eye-Q or any other graphics program from any other source, Ultraprint delivers. An amazing 22 styles to choose from: enhance contrast (for line output) or gradation (for pictures) and vary magnification... A printer without Ultraprint is no printer at all.

## MEDIA MANAGER SPECIAL EDITION MEDIA MANAGER

MMSE is a joy to use. Whether something has gone wrong with a disk (the "Not found", "Not valid Quill file", "Bad or changed medium", "Read/write failed" etc) or whether you want better control over your programs and data, MMSE should be to hand. Virtually any calamity can be recovered from automatically: all permutations (accidental deletion or part-overwriting, part-formatting, errors yielding: bad map but OK directory, bad



directory, OK map, bad map and directory, OK map and directory but bad file sectors, unknown fault, power glitch corruption and so on) have been carefully thought through and catered for. If nothing is wrong, but you just want to explore and understand more about your system, you can potter to your heart's content assisted by the clear and packed-with-facts manual. Dozens of different diagnostic printouts can be produced. The whole system is menu-driven, with context-sensitive, on-screen help for every option. The speedy Sector Editor is a positive delight: the collector file facilities, bulk recovery, auto-navigation, skipping through the medium in physical, file (if map), logical (if no map) or uncollected/logical (if destroyed map and because of "chequered" history with lots of overwriting/deletions no one-step recovery available) sequences must all be experienced to be believed. **MSSE** is extremely simple to operate, and assumes no advance knowledge whatsoever. Alternatively, if you wish to tidy up your disks or cartridges, **MSSE** allows you to change volume format names, sort directories into alphabetic, date or size order, analyse file contents and histories, change case of filenames, move data/programs to/from alien-format disks (introduce or break copy-protection systems (illegal use prohibited!)), **MSSE** can and will deliver the goods. It is absolutely superb. The standard Media Manager is much less powerful, and less easy to use. It is only for those on a tight budget.

## TOOLKIT III WITH ROM TOOLKIT III

Virtually everyone with a disk system has Tony Tebby's fine TK2 Supertoolkit on board (usually built into the disk interface). Toolkit III - which works whether or not you have TK2 - takes off where TK2 ended, adding about 70 new commands and enhancing many existing QL and TK2 commands. TK3 is for everyone with a QL. You can get this system on cartridge/disk, with or without a plug in ROM cartridge in addition. The documentation is complete and very comprehensive. Some of the added commands are:  
ADIM \* ADIMW \* AND L \* ATYP \* BASREF \* BV BASE \* CHANNELS \* CH BASE \* CINT \* CLOSER \* DEVLINK \* DIR USE \* DITS \* DIV L \* EOR L \* EXTRAS \* FACC \* FLP SEC \* FLP START \* FLP TRACK \* FLP USE \* FRAC \* ISFLT \* ISINT \* KEYS \* LARRAY \* LOWERS \* MEMCOPY \* MEMSWAP \* MJOB \* MJOB W \* MOD L \* NFS USE \* ODD \* OM INIT \* ONPIPE \* OR L \* PEEK F \* PEEKS \* PEND \* PIPE \* POKE \* POKE F \* PRED \* QDOSS \* QIN \* QOUT \* QTEST \* QWAIT \* RAM USE \* REPLACE \* REPLACES \* RESET \* RJOB A \* ROUND \* SARR \* SEARCH \* SETDIR \* SETDIR A \* SETHOST \* SETNET \* SETRO \* SETRW \* SETSYS \* SETUSER \* SGN \* SORT \* SORT I \* SUCC \* TK3 EXT \* UPPERS \* USER \* WN BASE \* WSETHOST \* WSETNET \* WSETRO \* WSETRW \* WSETSYS \* WSETUSER  
Whether or not you can program, Toolkit III is of great use!

## QFLICK CARD INDEX SYSTEM

Few users actually require all the facilities of a complicated database like Archive. QFlick presents a very convenient alternative - a very fast, simple to use card-file database, with easy to learn, snappy search and navigate commands and clean file-handling. You can move Archive data to/from QFlick. You can run multiple copies of QFlick. And QFlick's data is organised so it is easy to program from SuperBASIC, even for tyros!

## PERFECT POINTER TOOLS

This excellent program gives you an on-screen pointer (arrow) environment of incredible smoothness, and 6 utilities with it. To explore the world of QPtr, Things, Hotkeys, Window Manager...

## QTRICK MULTITASKING SYSTEM

A pull-down menu controlled multi-tasking front-end, ideal for running in the background and giving you notepads, file-handlers, quick backup, clock, diary, mini-database, calculator etc etc.

## DISKTOOL WITH QUICKDISK

An exciting way to accelerate disk access by upto 30%, add password protection to disks and to optionally increase disk storage capacity by 36K to 1512 sectors! All this works while maintaining full compatibility and normal disk control...

## DIGITAL C SPECIAL EDITION DIGITAL C COMPILER

Superb C compilers these - fast in execution, they produce extremely speedy and concise code. No-nonsense documentation is included. The Special Edition has many more features, including pointers, long pointers, structures, >64K code sizes, direct access to traps and vectored utilities, and is twice as fast because of its more efficient C/QDOS libraries.

## TURBO BASIC COMPILER + TOOLKIT

This state of the art system will automatically convert ordinary SuperBASIC programs - the sort you buy, write yourself or type-in from magazines - into machine code, the language of the 68008 CPU, the brain of the QL. Such pure machine code programs run "directly", without the need to be interpreted by any intermediary system. This direct execution makes them MUCH faster in execution than BASIC. Turbo also adds a host of useful high-speed commands (called "toolkit extensions" if you are fond of jargon). Here are some timings, all carried out on a JS Trumcard QL, to give you a taste of just how much Turbo can improve things:

	Iterations	SuperBASIC	Turbo'd	Speedup
Empty FOR...END FOR Loop	30000	49 sec	1.3 sec	38x
Empty REPEAT Integer Loop	30000	151 sec	2.4 sec	63x
String concatenation	3000	448 sec	0.4 sec	110x
Search through memory	300000	1410 sec	1.5 sec	900x

Turbo's automatic conversion process, called compilation, is as simple as this: (1) Boot up with the Turbo disk (2) Load in or type in your BASIC program (3) Enter the word CHARGE, and watch the friendly front-end menu pop into view (4) Choose a filename for the machine code task that is to be generated and (5) Press the SPACE bar. Turbo does the rest! Compilation is a one-off process, and is very fast too - it takes little more time than LOADING the original program did! Once compilation is finished you have a machine code version of the original program. Start this with EXEC, just as you used to invoke the original program with LRUN: besides the tremendous difference in running speed, you will notice that the program loading time is cut down to a few seconds at most (big SuperBASIC programs can take half an hour or more to load). The EXEC mechanism also allows you to multitask programs, something impossible with SuperBASIC, as well as manipulate their time-priorities, link them together, exchange data and even share parts of their code while executing.

If you are an advanced user, Turbo's numerous fine-tuning facilities, 200-command toolkit (a terrific complement to the famous Supertoolkit) and 300+ page manual will be irresistible. If you are a beginner, you will wonder how you ever did without Turbo's program diagnoses and auto-correction. Turbo is more than a very clever optimising compiler. Turbo is magic. If you do not have it, you can have no conception of the experience you are missing and the power you are forfeiting.

## SOLUTION WITH DR-DOS 75.0 SOLUTION

This program transforms your QL into a pretty compatible - albeit not fast - PC clone. Solution will run over 95% of the "big name" PC software you have read about, missing out only on programs that make illegal use of the PC's operating system. Solution works solely from software so you don't have to worry about ripping your QL to pieces to fit anything, or have anything hanging out of the back. Just boot up the Solution disk and you will be using a PC, which will then ask for a copy of DOS (any) - (just as it would if you were using a "real" PC). End of story - you are now using a PC. There are very few restrictions: both mono and colour CGA graphics are supported. 479K is available for PC software on a 640K machine and 67K when using Trumcard - more than you will get on a PC or XT! Speed can be increased by using Lightning Special Edition but in final analysis just can't compare with Conqueror's speed). Because your newly acquired PC is really a QL you can multitask two or three PC programs (try doing that on a "real" PC!). You can also run QL programs alongside PC programs (DON'T try that on a "real" PC!). Converting files (data in either direction) between QL and DOS is no problem and you can re-configure the QL keyboard if you wish.

## PROFESSIONAL ASTROLOGER PROFESSIONAL ASTRONOMER

Our use of the term "Professional" in the name of an application program does mean that the quality achieved will meet or surpass the highest professional standards for that application. The term does NOT mean that you have to have the knowledge of a professional in order to get the best out of the programs. Astrologer teaches you astrology from scratch, and enables you to produce reams (if you are short of paper, you can choose exactly how much) of narrative printout giving a person's horoscope, personality delineation, year-to-year life overview, detailed day-to-day (in fact minute-to-minute) predictions, as well as two-person compatibility interpretations. Also provides all the technical readouts, charts and zodiacal wheels you would expect. It is extraordinarily fast (there is a great deal of very clever maths within it) and it performs the whole computation in under a second. The author of the manual is the author of this advert, so you can expect a lucid and humorous read. Whether or not you believe in astrology - indeed, especially if you do not - this program is one that you cannot afford not to have. Scores of detailed readouts for famous people are supplied, incidentally - very interesting reading they make too... Discover Mrs Thatcher's secret yearnings, explore yourself, play the Stock Exchange... Astronomer is an extremely efficient solar system computer, with planetarium views, planet faces (with shadows/eclipses), five different co-ordinate systems, 1sec=1day cinerama, etc. Astrologer + Astronomer is supplied at a very low combined price.

## ACT SPECIAL EDITION

The Adventure Creation Tool is for every programmer or putative programmer. Whether or not you have any interest in adventures, you will find something useful here. Animated graphics, data compression, language design and parsing, maps, object-oriented control and much more, with an excellent educational manual too.

## 3-D PRECISION CAD SYSTEM

2-D and 3-D design and manipulation, at a speed sufficient to permit real-time animation! Whether or not your interest is serious 3DP will change the way you look at the world around us. The variation of viewpoint, perspective and magnification is very smooth in addition to dot-matrix output, plotters are catered for.

## SUCCESS

Run CP/M programs on your QL! What more is there to say, other than that after the PC family, no more common system exists than CP/M, with thousand of cheap programs... And Success is fast!

## THE EDITOR SPECIAL EDITION THE EDITOR

If your needs are for a technical Editor, or for full access to the entire ASCII character set (to handle machine code or compressed data files), or if your budget cannot stretch to PERFECTION, then this is the program for you. Editor is command-line driven and programmable. The Special Edition version is certainly better than the standard version: that is because the standard one contains only as many features as we could get to fit into an unexpanded QL. Both are fast and flexible, and very powerful indeed in the hands of the intelligent. Not a word processor, Editor's a way of life.

## SPECIAL DESKTOP PUBLISHER DESKTOP PUBLISHER

Both these WYSIWYG ("What You See Is What You Get") dtp systems are excellent in their own rights - it is only when you compare them with the stunning Professional Publisher that you become aware of their shortcomings. You won't get fonts as large or smooth as with PP, or wrap-around graphics, or as sophisticated a printer driver or text/graphics file import facility. You will get a very workmanlike tool, capable of producing output that the computer press described as fantastic and superb... The standard edition is the ideal if you do not have a disk drive: if you do have one, go for the Special version, which correspondingly has more features including textures, large windows, better drawing and improved command entry. All upgrades are possible and there is only a £10 penalty for doing it in two stages. So if you simply cannot afford PP, one of this pair is certainly for you.

## SUPERFORTH COMPILER WITH REVERSI

Why not learn FORTH, the most logical computer language of all? This superb FORTH-83 compiler produces stand-alone multi-tasking code of speed comparable to C. SUPERFORTH source is even portable to other machines! The manual teaches you the language.

## IDIS SPECIAL EDITION IDIS

Machine code (from other people's programs, toolkits and the ROM) is unintelligible until you put it through IDIS, the intelligent disassembler. IDIS Special Edition automates everything it possibly can, and requires no human intervention. It even sorts out subroutines, replaces addresses with names, untangles data from code and so on. Standard IDIS contains as much as we could pack into an unexpanded machine, and is nearly as automatic. If you want to find out how computers work, buy one of these two!



Never be short of a four for Bridge again. Superb bidding tutor included, based on random hands dealt with lightning speed. Manual a masterpiece. Understands and obeys ACOL and much more.

## SUPERCHARGE SPECIAL EDITION

If you have an unexpanded QL, or cannot afford Turbo, but want SuperBASIC programs to go faster, Supercharge is the answer. It has about half the speed of its big brother, is not as tolerant of badly-written programs, and lacks many of Turbo's features (like linking, program sizes >64K etc); nonetheless, it is the compiler about which we received over ONE HUNDRED happy letters from satisfied users all using the word "Excellent" to describe it - and hundreds more who used other equally complimentary terms. The only gripe was about the Lenslok copy-protection, long since removed by us. So now Supercharge is wonderful....

## SUPER SPRITE GENERATOR

SSG moves things about the screen rapidly, at machine code speed, directly from simple SuperBASIC. Any number of sprites (each with upto 16 frames for smooth realistic motion), 256 speeds, 256 planes, collision detection and dozens of special effects.

## SUPER ASTROLOGER

A cut-down version of the Professional Astrologer - smaller horoscopes and manual, no interpretations for forecasting or compatibility testing. A marvellous buy at the price!

## BETTER BASIC EXPERT SYSTEM

SuperBASIC is a super BASIC. If you want to improve your programs automatically, and learn as you do this, get Better Basic.

## TRANSFER UTILITY

Copies files between devices, performing translates as it goes. Needs a ramdisk to run. Can move your microdrive material onto disk, so programs run from disk but you still have access to microdrives.

## MONITOR

Check dynamic operation of programs - IDIS's ideal companion.

## TERMS AND CONDITIONS

\* Our non-game programs are very comprehensively documented with A4 manuals averaging about seventy pages in length (the largest is 325+). They are 4-hole punched for easy binding and storage.  
 \* UK purchasers - the quoted figures are all-inclusive. For the rest of Europe, add 5% (rest of the world, 10%) to the quoted figures to arrive at the VAT-free total (exports are zero-rated for UK VAT), inclusive of all freight and documentation charges.  
 \* Acceptable forms of payment are sterling cheque drawn on a UK branch of a bank or building society, sterling postal order, Eurocheque made out in sterling, international money order in sterling, VISA/ACCESS/EUROCARD/MASTERCARD (specify expiry date), foreign currency cheque (add 10% conversion charge), cash, direct funds transfer (notify us in writing, and ensure that all charges are paid your end, or add 5%) to A/C 50327808 DIGITAL PRECISION LTD at Barclays Bank PLC (Branch code 20-79-44) South Chingford Branch, 260-262 Chingford Mount Rd, London E4 8JN.  
 \* To upgrade from one version of a program to a superior program, send us the cartridge/disk. Except in the case of upgrades between program versions both with the same name, send the manual too. The cost of an upgrade is £10 plus the difference in current advertised price between the two programs. So the upgrade from DIGITAL C to SPECIAL EDITION DIGITAL C costs £30, and you would need to return the old manual as the program names are different. PERFECTION is not an upgrade to EDITOR, but SE EDITOR owners are allowed to claim a £5 reduction when ordering PERFECTION.  
 \* Our programs are all user-transferable between cartridge and disk, are all free from ALL copy protection, and all work with all drives, toolkits, RAM add-ons and disk interfaces (except for early MCS interfaces, to which the emulators and media managers object). Users of the Microperipherals interface are recommended to buy the QFLP ROM upgrade from Care. ST/QL Emulator owners will benefit from a c.2.7x speed increase on our software.  
 \* All trademarks used or referred to in this ad are acknowledged.  
 \* If you want Eye-Q, but want to use it with a Gigamouse, with QRAM or on a THOR, specify your intended use with your order.  
 \* We supply unused cartridges @£3.50 each, £30/10 or £55/20.  
 \* Digital Precision supplies quality hardware too - write/phone.  
 \* Digital Precision (abbreviated by our admirers to DP!) is a trading name of DIGITAL PRECISION LIMITED, Company Registration No. 1833989, registered in England & Wales, VAT Reg. 420 1560 08.

PC CONQUEROR WITH DR-DOS V5.0	169.95	eT
PERFECTION PLUS WITH SPELL CHECKER	119.95	dT
THE SOLUTION WITH DR-DOS V5.0	119.95	eT
PC CONQUEROR	89.95	eT
PROFESSIONAL PUBLISHER	89.95	cT
PERFECTION	79.95	dT
TURBO BASIC COMPILER + TOOLKIT	79.95	aT
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# QL

# S C E N E

## A new QL Special Interest Group

This month, *QL World* is co-operating with newly-formed QL special interest group QLaw (QL Advancement Working Group) to issue the first broad-based questionnaire on the QL and its users since the early years of its development (see pages 25-28). This pull-out questionnaire will be analysed by QLaw to provide a detailed profile of the QL community and its future needs. An article or articles based on the analysis will appear in *QL World* later in the year.

Founder Dr. Sohail Bhatti describes the idea behind QLaw: "QLAW is a new interest group formed to encourage the development of QL/QDOS related products, both software and hardware, as a means to the production of a new SuperQL. This new machine is its main goal, and it seeks anyone who would be interested in participating. This includes not only those with hardware and software expertise, but also those who would wish to purchase such a machine. Joining would be a

clear indication of interest, with the expectation that QLaw would use the group strength to generate a QL-compatible machine fit for the 1990s. By sharing resources, QLaw would seek to make the task manageable."

To join QLaw, there is no compulsory subscription, but as launch capital is minimal, a donation of £10 is requested for registration on the mailing list. "I have chosen a sum which I hope will allow such developments as seminars, hardware and software design as well as pay for mailing," says Dr. Bhatti. Users who are interested in joining but cannot afford the £10 might like to approach Dr. Bhatti with alternative suggestions.

A professional statistician and long-standing member of Quanta, Dr. Bhatti has gained support from some fellow-members, members of the committee, and also from QL designers and suppliers. QLaw is however intended primarily to co-ordinate the requirements of users rather than suppliers.

"QLAW is intended as a users' group and so will exclude all traders from influencing QLaw decisions. However, it will seek to develop a consensus amongst all users, so that there are common goals and standards", writes Dr. Bhatti.

Ultimately QLaw's aim is to co-ordinate design skills and user needs within the QL community to develop and extend the QL to meet the challenges of the 90s. He argues what many users believe: that the QL and QDOS is an advanced system which is under-used. Now is the time, he believes, to consider what can be achieved by pooling the best of our resources, and spreading the load of development.

Up to date news will be shared through the mailing list, and designers would be able to call on the membership for beta testing of new products. A non-disclosure agreement would ensure security and a fair share in the gains for individual design work.

The QLaw questionnaire will also appear in a substantially similar form in *Quanta*, and

CGH Services' QL Technical Review, as well as through various overseas user groups. The *QL World* questionnaire incorporates a number of questions relating to the availability and value of *QL World* itself which will not, of course, appear on other drafts of the questionnaire. The analysed data and comments in this section help the magazine for QL users to plot its future contents.

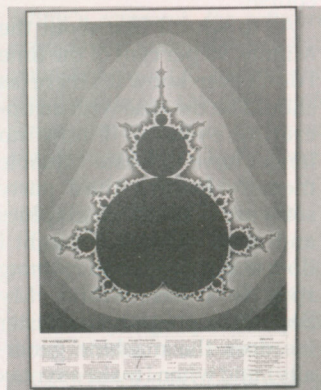
To join QLaw or obtain further information, write to **Dr. Sohail Bhatti, 4 Wasdale Avenue, Park View, Blackburn, Lancs. BB1 1XD**. Please make cheques payable to QLaw. Stamped self-addressed envelopes are appreciated with enquiries, to keep down running costs.

*QLAW and QL World have no association other than in the publication and analysis of the QLaw/QL World questionnaire appearing on pages 25-28 of this issue. QLaw is a non profit making user group which does not claim endorsement from any commercial organisation.*

### Fractal poster

Organised Chaos is a business in Manchester which is dedicated to producing high-quality small-poster sized fractal images. The sample deposited with *QL World* is an A2-sized, glossy poster showing a Mandelbrot image on a purple background, with a short history and commentary on the Mandelbrot Set at the base of the sheet.

Says OC's Colin Menhinick: "The computer generated images are as clear as a colour



photograph. There are no marks, castle edges, blurred spots or fine lines missing. You get the full majesty of the image in hairsbreadth detail." He sees the posters as an educa-

tional resource for Maths and Computing departments, and the sciences in general.

Organised Chaos offers its posters with a money-back satisfaction guarantee. The posters cost £9.95 inclusive of VAT, plus £1.50 post and packing. A block-mounted version, designed for school and college use, with a washable surface, costs £29.50 inclusive of UK carriage and hanging set. The poster sent to us arrived in a heavy-duty card tube with a strong plastic stopper, in perfect condition.

Orders and enquiries to **Organised Chaos, 10 Stanton Gardens, Manchester M20 8PT. Tel: 061 228 7356**.

### Guide slip

Our apologies for two misprints in Part Three of the *New User Guide*. At the bottom of page 27, the PAPER command should read PAPER#2,4, and on page 28 under the AT command, the commands in the text should read AT#2,4,2 and PRINT#2. The short program over pp.27 to 28 should finish with:

CLS #2

Reader Dr. D C Lewis of Shrewsbury points out that the reference to the window number at the bottom of page 27 should more properly read 'channel number'.



# OPEN CHANNEL

Open Channel is where you have the opportunity to voice your opinions in *Sinclair QL World*. Whether you want to ask for help with a technical problem, provide

somebody with the answer, or just sound off about something which bothers you, write to: Open Channel, *Sinclair QL World*, 116/120 Goswell Road, London EC1V 7QD.

## Rejoice

I have been a regular daily business user of *Quill* for the past five years, and am writing this letter as a result of seeing a pre-production version of Digital Precision's *Perfection* demonstrated at the London Quanta sub-group.

As someone who is all too familiar with the destructive quirks of *Quill*, I would say, forget your concerns that nothing can be as useful and as uncomplicated as *Quill*, and put your order in for one now.

I am pleased to say that this is probably one of the last letters I will ever write where there is

a possibility that the cursor will disappear and that in an instant I will lose a carefully worded document.

Nigel Spencer  
London SW17

## Register

I found Gavin Monk's LDEF command described in June 1990 very useful, and so was disconcerted when on one occasion it wouldn't work with the later procedures and functions in a Basic program. On re-checking the listing, I noticed that in lines 53 and 74 index register A2.W instead of

A2.L was used. This is alright when Basic programs are small, but fails if they are larger, because the name table and name list come higher in the Basic area than the program.

Also, I am surprised that after line 68 we do not have EXT.W D1 and EXT.L D1 to allow trouble-free addition of D1 to A1 at line 92. After all, we are told that CA.GTSTR corrupts D1 and, at line 41 that seems to be the last place D1 is used. At line 68 only D1.8 is set, so the rest of D1 could be anything.

G D Gwilt  
Edinburgh

## Minerva

Some time back you asked for people's experiences of the *Minerva* rom. Here are some of mine. I've had three versions of *Minerva* V1.61, 1.66 and 1.81, each one better than its predecessor and all of them better than the old JS roms. I use my machine for word processing, using DP's *Editor* and Psion *Quill*. I also run Borland's *Turbo C* under *Conqueror* for a college course.

As to what I like about the *Minnie*, 90 per cent of the time I don't even know it's there (as should be the case with an operating system). I now no longer have to waste valuable memory loading third party software to speed up graphics and math routines, though I do use the excellent *Lightning* rom text extensions. My SuperBasic programs run faster (as does the machine generally), and when I make a syntax error *Minerva* shows me the point on the line where I made the mistake.

Not only can I use cursor left/

right to navigate round a line, but *Minerva* implements Home and End keys with an ALT LEFT/ALT RIGHT combination. There are also line delete keys.

My machine starts up faster (I have a full Trump Card), there is no more waiting ages for the ram test. *Minerva* does a more thorough test of ram, and if I have a duff chip, *Minerva* will tell me, so I can now be more confident of my QL hardware. If I run a QView program, I can even get a schematic diagram of where an offending ram chip is.

I like the idea of Qdos being back under development. It is nice to have an operating system that has customer technical support again. Qdos was never 'finished', and anyone who wants to stop its development at the old MGs obviously hasn't grasped Sinclair's original dream for the machine. *Minerva* isn't perfect, but it is getting there.

Dominic Brown  
West Kingsdown  
Sevenoaks

## Strings

I have found a bug in SuperBasic I have not seen detailed before. It concerns the comparison of strings. Some characters are considered equal by the interpreter, which are obviously not. I stumbled on this while writing a guarded input routine; the character 0 is effectively the same as the cursor up key. The only way to distinguish is to compare CODEs. I have since found a total of 64 cases (see enclosed printout). There is an interesting effect: for example, A is equal to CHR\$ 225, and a is

## Editor's notebook

Looking back over the QL's history, we see various drives that were made towards an integrated QL, equipped with disk drives and a far larger memory capacity. New machines have sprung up and then faded as their producers fell foul of various obstacles. We strain an ear to hear news of the Thor, but all official sources have been ominously silent – in this quarter – for some time.

Yet 1991 may be the year of regeneration. Miracle Systems have released a major upgrade board. Digital Precision have produced a top-of-the-line word processor. Is this the time for new special interest group to be calling for more co-operation towards developing upgrades for the QL? Hasn't it been done?

I think the answer is yes and yes. It is being done, but further co-operation from people of talent and commitment may be hoped to produce further good. It may fall on stony ground – but why not try?



equal also to CHR\$ 225 but A is not equal to a (using == completes this).

A few months ago, Mike Lloyd gave a function for signum: RETurn 1-(x<=0)-<x<0). This does have an elegant simplicity, however, the alternative, RET <x>0-<x<0> works just as well.

**Caleb Leeke  
Huntingdon  
Cambs**

## Tonto

For some time I have been using a BT Merlin Tonto computer. I understand that it is a derivative of the Sinclair QL and was on the market in the early 1980s.

I use it both for its word processor (Quill) and its spreadsheet (Abacus), as well as the telephone side, and find it an invaluable office tool.

I have been reading QL World for six months now and find it very interesting, but wonder how relevant the articles are to my Tonto in the long run. What do other Tonto users (if there are any) feel?

**L M Westall  
Yarnton  
Oxford**

## PC Format

I have vast amounts of data created using Quill, Abacus and Easel. I have to be able to access this data using any of a selection of programs on the PC, including the Psion PC4 package, which looks a lot like the QL version.

I have PC Conqueror and its disk conversion facility, but am unable to access the files correctly once they are on PC format disks. What do I do to get my files into a readable format?

**C A Bland  
Green Street Green  
Orpington**

*Editor's comment: First, you should ask Digital Precision's advice. Always talk to the publisher first. Also, somebody experienced in using DiscOver may be able to advise. Transferring data between one operating system/utility combination and another totally different combina-*

*tion can be a knotty problem even with bare Ascii files.*

## And again

Here is a little problem that I would like some help with; I have been using an IBM compatible (an M31PC SMC PC-386XP) for the past 18 months (along with my trusty QL). The IBM clone has both 3.5in and 5.25in floppy drives, as well as a 40MB hard disk, and runs DR-DOS using all the function keys from F1 to F12.

I will shortly be losing the use of the M31PC - how can I transfer all my software and files to use on my QL? This is a considerable amount. What would I need to purchase to run all this on my QL? And what would it cost? I am using Ability Plus from Migent, Sage Accountant Plus, Logitech Finnesse DTP and some other simple programs. Will I be able to use these? My main software packages are stored on hard disk and I use this to run each program using the CD/command. But I have very little actually stored on the hard disk.

Please bear in mind that I am not totally computer literate and just get by with simple instructions.

Just to give you all a chuckle I have yet to add disk drives to my QL and am, like a few others, still running the basic machine with mdvs. I know that I will have to upgrade, but is it going to be financially viable?

**John Crompton  
Oakehampton  
Devon**

*Editor's comment: the software exists to port material from a PC-compatible to a QL system, and also emulate the MS-DOS environment on a QL. Your first move should be to talk to Digital Precision, who publish the main PC emulation program Conqueror.*

*You will certainly have to expand your memory if you are to run a DTP package on a QL. Miracle Systems market a disk drive interface and memory expansion board, and EEC Ltd. may also be able to advise. Beware of moving straight to a hard disk if you are not very confident on your computers.*

*As for which programs you can use, again this is something you will have to talk over with the publishers of the emulator, because it is on that that you will depend.*

*As to whether it is financially viable, that will depend on cost of setting up your own PC system versus cost of expanding your QL. There are two points you haven't covered in your letter; one is how much you currently use your QL and what investment you have already made in it, in software, and the other is: are you the owner of the PC-compatible programs you list, or are you relying on copying them from your place of work? If you were considering the latter and the legal aspects of this had not occurred to you, remember that you would be in breach of copyright, and also that your programs would then be unable to claim upgrades or seek assistance from the publishers.*

*If you have to rebuild your software collection rather than simply porting the data, this will make the sums look rather different. There is a great deal of good software for the QL, including accounts and DTP.*

## Agenda

Am I alone among your readers, or is there another Agenda/QL user out there? The Agenda is an organiser with several extra features compared to those mentioned by David Drysdale last autumn - touch typing entry system, and the most remarkable Finding and Printing system that I have yet to find. But when I came to trying to store backup files on the 3.5in disks of my Sandy-expanded QL (JM rom) using serial interconnection, I found that I need some routines to negate print instructions when sending "organiser to QL", but could send anything the other way.

I use Editor Special Edition, from Digital Precision. The Agenda has a very useful system of sub-files, one for each letter of the alphabet within which searches can be made very quickly; addresses under A, telephone numbers under T are obvious choices. My address list transferred to QL (with a few non-print characters) and my only worry was a lack of indication when transfer was complete. The same file sent

back to Agenda arrives as a series of lines with nothing to show where one address ends and the next one starts.

It is a good to be able to write letters on trains and buses, but the ability to edit on a monitor before printing and store on disk would be a big asset. I write in the hope that someone else has made some progress along the same path: my 24-pin D connector, QL Ser and 25-pin D connector numbers are as follows:

1,2,3,5,7,20

GND, 2 3 4 1 5

-, TX, RX, CTS, Sig, GND, DTR

**Alec Wilson  
Colden Common  
Winchester**

## Cattle

I bought a QL about five years ago with the idea of using it for my work, which is looking after 150 cows. The idea was to use it for breeding, milk records, health records and the pedigree records of each cow. Because the QL User Guide is so large and it takes time to learn everything about the QL, I have never got as far as using it for my working records.

Now the National Milk Records have come up with Herdfile software. They supply a single disk every month with all the details I require up to date. The problem is that the disks, which are available in 3.5in and 5.25in, are only suitable for IBM or IBM compatible computers. My other question is, can a disk drive of any make be fitted to my QL to enable me to use this service?

**C A Trim  
Alresford  
Hants**

*Editor's comment: Software designed for IBM personal computers and their compatibles runs under the MS-DOS operating system, not QDOS as used by the QL. To run programs under MS-DOS, you would need an MS-DOS emulator. You should talk to Digital Precision about their program PC Conquest. Not all MS-DOS software will run under a specific emulator, so they may need to see a test disk.*



# QL HARDWARE REVIEW

## CQV1 REAL TIME DIGITISER

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Although they do a similar job, video digitisers and digital scanners are very different pieces of equipment. A digital scanner is an optical device which is moved across a printed image in order to copy the image into a computer's memory. Jurgen Falkenberg's scanner is attached to a standard dot matrix printer head in order to provide motive power. A real-time video digitiser, on the other hand, also converts images into a digital format, but its image source is a video recorder or a video camera. Where a digital scanner can take ten minutes to scan its image, a video scanner has to perform the same task in a fiftieth of a second in order to capture a video frame. The results can be astonishing.

### Scanning

Video scanning has a number of practical uses. The computer can be programmed to capture an image every few seconds or minutes in order to produce a time-elapse sequence of images. Point your camcorder towards a cloudy sky (nowhere near the sun, of course) and the QL can be programmed to capture and store an image every five minutes for almost two hours. Replay the images and you will see the same cloudscape unfold in a few seconds.

Alternatively, the video digitiser can be used to print out selected images from a camcorder sequence to assist in editing, or to provide a printed graphic record of what is on a video cassette.

Desk top publishers are going to find an instant use for video digitising because it can capture video and tv screens in a form suitable for importing into documents. Unlike the digital scanner's output, the images produced by the video digitiser need very little 'cleaning up'. Of course, if you use an art program like Eye-Q you can use tv screen images sampled by the digitiser as the basis for your own original artwork.

Firstly, though, the practicalities. The video digitiser is a box 18cm by 11cm by 5.5cm which fits into the rom expansion slot at the rear left of the QL, completely dwarfing the displaced Super Toolkit II

■ Mike Lloyd meets a machine that takes pictures from the tv, and keeps them.

rom which normally lives there on my system. Although it is a large box it feels extremely light. In order for it to be stable it must sit on the same surface as the computer, so the QL's ridiculous plastic feet will have to be removed. If the QL is sitting on a highly polished surface, a bit of Blu-tak under both the computer and the digitiser will ensure that they remain married together throughout a session.

A major logistical exercise, in our house at least, was the positioning of the QL within a cable-length of the video recorder. If you are still using the family tv set for your computing this is unlikely to be a problem, but it's a little more complicated for those of us long since banished to the spare bedroom to practice our black arts. Following successful negotiations, the QL, disk drive, keyboard extension and a six-way power distribution block arrived in the front room. The printer stayed upstairs because the CQV1's software allows images to be saved to disk and printed later.

The sequence of events at the start of a digitising session is critical. Firstly, have everything turned off while the cable connections are made. Set up the QL system as you would normally and add the video digitiser to the rom port. Next, connect the digitiser to the video source (a camera

or a video recorder) with a standard phono-plug cable such as those found on stereo systems and usually with camcorder systems.

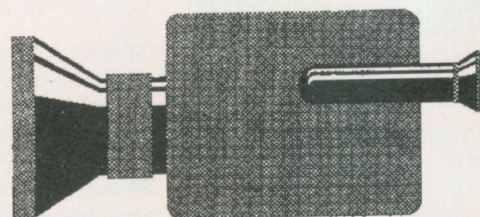
After making sure that all the connections are sound, turn on the video source before booting up the QL. This ensures that no damage is done by stray electrical surges and imbalances between the various circuits. If the QL does not boot in the normal way, remove the power as quickly as you can. Incidentally, the instructions provided with the review copy of the machine tell you to turn the video recorder on first some two paragraphs after it tells you to turn the QL on.

### Samples

Two boot files are included on the disk accompanying the digitiser, one for floppy disk systems and another for microdrive users. Other files contain a small amount of runtime extensions and the main executable file. A couple of sample screens are thrown in for good measure.

The default system boot file simply loads the extension codes, leaving you to launch the executable program in your own time. This is sensible because the digitiser is fully multi-tasking, allowing you, for instance, to have a real-time tv image show-

### QL Video Digitizer Main Commands



F1 Draw Menu	D Select Display	SHIFT + F2 Store Image
F2 Save Image	S Auto/Manual	F3 Recall Image
F3 Load Image	sample mode	
F4 Sample Input	N Negative Image	CTRL + F3 Merge Images
F5 Clear Screen	I Inverted Image	
	P Print Dump	CTRL/SHIFT + F3 Merge Images



## QL REAL TIME VIDEO DIGITIZER

CL SYSTEMS



Some sample screens included by CVS with the video digitiser package.

ing in the top corner of a screen otherwise devoted to a Quill session.

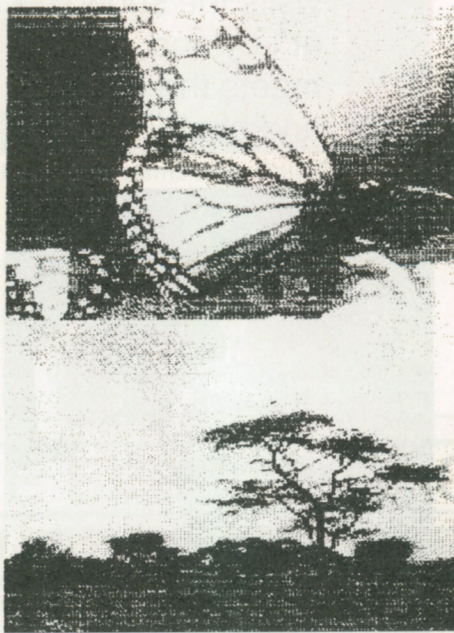
When the program has been loaded the main menu appears below a digitised picture of a sports car. The controls are very straightforward and can be memorised within a few minutes of using the system. The function keys are used to display the menu, control disk/micro-drive access, start the real-time sampling and clear the screen. Throughout the review period the software behaved faultlessly, like the construction of the device itself, gave the impression that the video digitiser is a very well thought out peripheral produced by a company with high standards of workmanship.

### Capturing

Pressing F4 starts the image capturing process in manual mode. Every time the space bar is pressed a video image appears on the screen. To move to the real-time sampling mode the 'S' key is pressed. With the full QL screen being used to display the images a new frame is produced every two and a half seconds. The clarity of the image is amazing, especially as the QL has only eight colours and a 256x256 pixel resolution at its disposal.

It is probable that at the beginning of each sampling session the digitiser's contrast will need adjusting. This is done by turning the only control the digitiser needs, a small red knob mounted at the back of the box. At one extreme, the QL display is all whites, cyans and yellows while at the other the picture is black, red and blue. Optimum adjustment is easy to achieve. This facility contrasts with the post-scanning adjustment of the colour balance available on Falkenberg's digital scanner.

Three screen modes can be selected whether you are in 'step-mode' or are sampling 'real-time'. Pressing 'D' toggles between a full-screen display, a quarter-screen display and four quarter-screens refreshed sequentially. The quarter-screen display in step-mode proved extremely interesting during action sequences in films. Quarter-screens are refreshed so quickly that the refresh rate does not be-



come obvious except during camera-panning sequences.

The clarity of the images matched with the sometimes bizarre colouration turns even the dullest film into a new art-form. Printing out a picture on a dot matrix printer, however, turns the colours into a more acceptable grey scale. The print quality provided by the in-built print dump routine was quite sufficient for normal use, although I found Sidewinder was invaluable for cropping and re-sizing the images.

### Video tricks

Some additional video tricks have been added to the digitiser package. Screens can be stored in ram by pressing Shift-F2. With expansion fitted, more than a dozen full-screen images can be saved. Other keypresses allow you to recall the pictures, invert them, turn them into 'negatives' and merge them into each other. Their value is perhaps open to question,

but the code to implement them is so simple that they do not add much to the bulk of the controlling program. For more involved manipulation of the images Eye-Q permits greater expression.

The CQV1 video digitiser proved easy to live with, once the computer and the video had been moved to within sight of each other. The menu selections were sensible and the more commonly-used ones were readily remembered. The program operated flawlessly and produced no clashes with other programs tested. The digitiser is available from CL Systems (See also their ads in the back of QL World) for £123.000

### INFORMATION

**Product:** CQV1 real-time video digitiser.

**Supplier:** CL Systems, 403 Chapter Road, Dollis Hill, London NW2 5NG. Tel: 081 459 1351.

**Price:** £123, inclusive, state mdv or flp.



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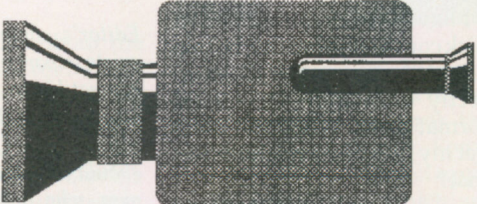
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**M**iracle Systems' new Gold Card provided all the buzz at the April 27 Leyland computer show organised at Runshaw College, Leyland, Lancs, by Sector Software's David Batty.

As some enthusiasts prattled on about the Gold Card heralding the new golden age of the QL, others wondered just what they would be getting for £375, which, let's face it, is almost as much as some people paid for the computer in the first place.

The Gold Card, it seems, is a replacement for all existing ram-plus-disk interfaces and other QL expansions, and a trade-in allowance will be made against, them varying between £25 and £150.

The new expansion will speed up the QL by as much as four times and give almost two Megabytes of ram. It will also accept new disc drives with a total capacity of up to 3.2 megabytes. In addition the expansion houses a battery-backed clock.

A battery-backed clock is also a feature of the new £65 Minerva Mk II rom, introduced at the show by Tony Firshman. This clock, on its own chip with 256 bytes of ram, has the advantage of being completely crashproof. The new Minerva MKII has a Philips 12C interface which is able to drive a whole range of chips. It also has a switching facility as part of an analogue/digital Philips chip interfacing to the 12C bus. This facility was used, at the show, to control a robot playing the old Chinese game of 'Towers of Hanoi'. The battery ram can also be used to autoboot QLs, via the network, without any drives being fitted.

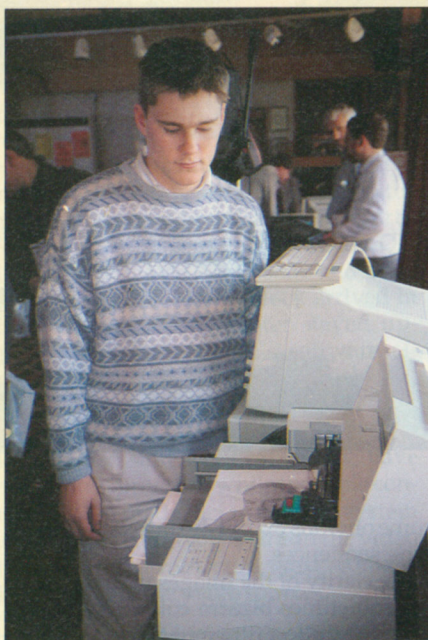
Another new product was Digital Precision's word processor *Perfection* which Freddy Vachha says 'will knock your socks off'. How many programs Freddy actually sold at the show is anybody's guess, as the demo was so fast and furious that it was difficult to get even the tiniest order in edgeways! Plenty of leaflets were being picked up, however, and there is no doubt that orders will come rolling in by post once the many features of this idiot-proof word processor have been digested.

# NEWS FROM THE NORTH

**D**avid Drysdale visits the show at Leyland, and meets the newest and best.

This after-the-show sales boost is par for the course on these occasions according to Tony Phipps, Business Development Manager of EEC Ltd., whose stand had leaflets offering an Epson 3.5in 720KB floppy disk drive for just £38 including VAT. A Sinclair 14in CGA colour monitor was also on special offer at £120 and back-up JM version QLs for only £85. Tony says he is highly optimistic about the future of the QL. His company, he says, will continue to support it to the full.

The show's organiser, David Batty of Sector Software, was finding plenty of interest for his £14 crossword-solving program *Wordsmith* which could find words and solve anagrams at lightning speed. He demonstrated by keying the letters 'ology' and thirteen words containing it came up in less than one and a half seconds. His *STD-Index* program was also selling well. This stand-alone database of over 6000 UK dialling codes was developed to enable users to find a place location from a telephone number. People buying goods advertised in magazines



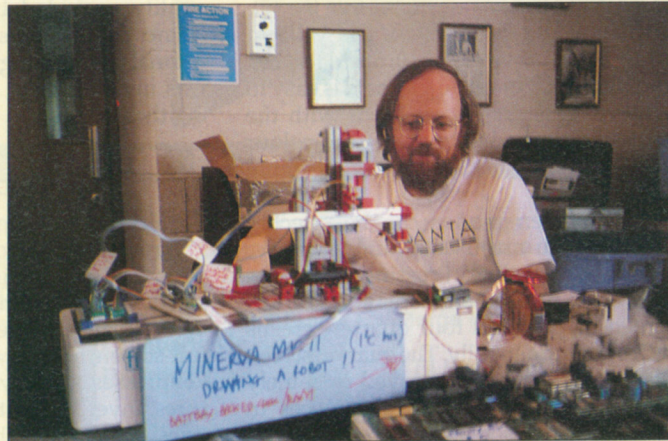
QLAS printing SPEM portraits.



Minerva author Lawrence Reeves.



Freddy Vaccha of Digital Precision.



Tony Firsham demonstrates the new Minerva.





Tony Phipps of EEC Ltd., and stock.



Miracle Systems' new Gold Card.

such as *Exchange and Mart* would find this program useful as they would know how far away the vendor was and whether the bargain was worth picking up. With director enquiries costing 40p a time this program, at £14, would pay for itself in the first 35 queries.

Other inexpensive programs which seemed to be selling well were *QL Genealogist* and *Super Disc Labeller* on the Dilwyn Jones Computing stand. At £19.50 *Genealogist* was his best selling mail order program, said Dilwyn, but a lot of interest was now being shown in *Super*

Disk Labeller which not only produced neat labels in various type sizes but also printed disc sleeve inserts and Directory page printouts. The cost of this program was only £10.

A tightly packed and up-to-date 16 page list of programs including games, utilities and fractal and mathematical recreation programs was available on the CGH Services stand. One program for sale soon is *Cribbage and Bridge Scorer* which will allow the well-known game of crib to be played on screen.

Club secretary Ron Dunnett and Dennis Briggs were representing Quanta at the show. For Ron it meant an exhausting 500 mile round trip. The local Quanta Lancs Area Sub-Group QLAS were there too displaying their newly minted tin badges bearing the QLAS logo. Their stand featured a video camera and Spem digitiser, which they were using to make portraits of the visitors.

Although it was an all-formats show, the QL sector was dominant. Other exhibitors seemed pleased, however. One non-QL dealer, Mr S A Raja of Scan International, told me he had sold over 3000 3.5 floppy disks during the day, on top of printer and computer sales. I left the last word to show visitor Richard Cooke of Wigan. Did he intend to buy anything at the show? "Of course", he replied. "The new Gold Card, what else!"

## CARE ELECTRONICS

### QL SUPERTOOL KIT II by Tony Tebby

Over 118 Commands: Full Screen Editor, Key Define Print Using, Last Line Recall, Altkey, Job Control, File Handling, Default Directories, Extended Network, 16k Eprom Cartridge Version .....@£23.50d  
Configurable Version on Microdrive .....@£23.50d

### MIRACLE SYSTEMS PRODUCTS

OK Disc Interface (Inc Tool Kit II) .....@£99.64b  
QL Centronics Printer Interface .....@£29.61d  
QL Expanderam 512K ThruCARD .....@£99.64b

### QL HARDWARE

Single 3.5" Disc Drive & (Own PSU) .....@£105.75a  
Dual 3.5" Disc Drive & (Own PSU) .....@£176.25a  
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Care Eprom Cartridges each .....@£6.11c  
ULA CHip ZX8301 .....@£15.98c

### SOFTWARE 87 (State MDV or Disc)

TEXT87V3.00 (Requires Min 256k) .....@£60.00d  
FOUNTEd 89 .....@£15.00c  
FOUNTEXT 88 .....@£25.00c  
TEXT 87/FOUNTEd 89/FOUNTEXT 88 .....@£94.94b  
248B PRINTER DRIVER .....@£15.00c  
Upgrade to Text 87 V.3.00. Return old copy together with .....@£25.00d

### MONITORS (Price including lead)

Philips CM8833 Colour Med-Res .....@£258.50a  
Philips BM7502 Green Hi-Res .....£99.64a

### HOW TO ORDER:

By Post. Enclose your Cheque/PO made payable to CARE Electronics or use ACCESS/VISA. Allow 7 days for delivery

### QPAC II

QPAC II Main menu windows adjust automatically to size. Files, directory, view, print, delete, backup, jobs, pick, Rjob, sort, channels, things exec, wake, buttons, Hotkey, Hotjobs. Fully multitasking, allows many programs to run at once. Requires min of 256k expanded memory .....@£49.35b  
Upgrade QRAM to QPAC II return master .....@£29.61b

### PLEASE SEND SAE FOR FURTHER INFORMATION

### TONY TEBBY SOFTWARE (QJUMP)

QLFP (Micro/P disk interface upgrade) .....@£15.51d  
QTYT Type/Spell Checker .....@£30.55d  
QPAC 1-Desk top accessories, calander, alarm, calculator, typewriter, digital clock sysmon .....@£22.56d

### ZITASOFT SOFTWARE by Steve Jones

LOCKSMITHE copies M/DRIVE - M/DRIVE @£14.10c  
4MATTER + LOCKSMITHE copies M/DRIVE - DISC ..@£23.50c  
SIDEWINDER - High resolution printer driver prints full screens or parts of screens from postage stamp size to large banners. Prints sideways, invert, scale, mirror, text insertion .....@£20.21c  
SIDEWINDER PLUS - (for expanded QL's) includes all the features of above, PLUS multiple label printing, desk-top publishing files and printer driver for 24" pin plus printers LC10 and Jx80 colour printers. (Please state 3.5" disc or M/D) .....@£23.50c  
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c=No charge d=£2.35



# T A P R O U B L E

Every month or so, there is some software and/or hardware development (however minor it may seem) on the QL scene. The *Gold Card* has been further developed, and has been demonstrated with both 12 and 16 MHz cpu chips. It now looks as though the 16 MHz version will be available right from the start, and the small difference in price suggests there is little point in buying the slower version.

Considerable improvement has been shown in performance of various programs, when run under the Gold Card. *Quill* clearly runs much faster. *Perfection* is even faster than before, but it was so fast anyway that the improvement is in fractions of seconds. Even *Lightning* has more effect. *Professional Publisher* is a program which shows improvements in some areas but not in others; routines that are written to run in a set time will still do so, but menus appear much faster. The relative slowness of menu activity irked me as much as anything it should be nicer to use now.

Perfection continues to change its face, although the 'works' have been mostly finished for some time. The user interface is reported to be much improved and a definitive version of the program should be available for checking any day now. There is no doubt that the combination of the Gold Card, high-density disk drives, and Perfection will transform the QL for word processing work.

QFile reports that *Discopy* has reached version 2.07, and the manual is now laser-printed. The latest revision was necessitated by a problem when using the program with the Atari ST QL Emulator; operation on this combination is now correct. The program will be reviewed shortly. *MS-QLink* is at version 1.6 and has a new manual, also laser-printed. The new version provides two pages of Help when F1 or F3 are pressed.

Hearing about computing in another country can be interesting. A guest in our house at the time of writing is a young man from East Germany, who is a computer enthusiast. From what one reads in the newspapers, it would be reasonable to expect him to have an ancient Spectrum, which cost a lot of money, and be using primitive programs, written by himself. Not so. He has a fast PC (25 MHz), with two hard disk drives, and plenty of up-to-the-minute software.

## Bryan Davies considers 'a new phase in the QL's life'.

The only thing that is what I had expected is that almost all the software is pirated. He has been comparing prices here with those at home, and tells me everything is much more expensive here. So far, the only thing (of any sort) that he has found cheaper in the UK is a postage stamp! Maybe this situation will change, when the effects of the initial, artificial exchange rate between East and West German currencies wears off. A local QL friend demonstrated *Qpac* to our guest (who uses Microsoft *Windows* on his PC), and he was duly impressed that a computer which he had never before heard of had something similar to what he used; he had not been aware that there was a multi-tasking 8-bit computer.

This brought up the inevitable discussion on text only — as opposed to graphics — interfaces, and I found myself in the minority (as usual). There is a lot in common between *Qpac* and *Windows*; both give a very attractive screen presentation, and require a mouse, to be used sensibly. On the surface, both programs allow the user to do almost anything, simply by playing tunes on mouse buttons. Coincidentally, I had just been *trying* to get two *Windows* demonstration programs working, so was ready for some discussion (to put it politely) on the subject of text-versus-graphics interfaces.

### Space required

Although there are similarities between the QL and PC products, there are some big differences, the most obvious one at first being the space required to house what are, after all, only utilities. Would you believe that the *demonstration Windows* program requires about 5 MB of hard disk space? Since most of the program functions in the demonstration version are disabled, one could expect the 'real thing' to need a couple of other computers networked-in to get it running. Actually, it's not that bad, but you need about 4-plus MB of disk space for the program alone

(without demonstration files and functions I would not use). At this point, you can start looking for space to house the programs you actually work with. It's a bit like saying that you, as a Quill user, need 50-100 KB to do your work, but another 500 KB is needed to connect you to Quill.

We are at the start of what may be a new phase of the QL's life, with the advent of the *Miracle Gold Card*, and the 2MB of memory it provides for us. For us, that 2 MB will allow the running of several, big programs, as well as something like *Qpac*. The poor PC user, trying to do a similar thing, wouldn't even get the utility program working reasonably, let alone have any applications programs working as well. No, I'm not confusing disk storage with memory. *Windows* also requires large amounts of memory to work properly. My German friend has a 'swap file' of 8 MB set up, so that *Windows* can handle the switching from one program to another, as well as its housekeeping functions. Even so, one of my own reasons for not using *Qpac* is that it uses more memory than I can spare — on an 896 KB system. It is to be hoped that any programmer developing utilities for the QL in the future does not follow the PC route, now that there is 2 MB available, and write utilities that take up more space than the programs we want to use.

That's one point of view. The other main one appears to be that the utility program is the most important thing, and is what computing is all about. That is, a computer should not be for doing work on, but for playing with. Fortunately, there's enough choice of software for the QL to suit both types of user fairly well. It does seem to me though that we are short of some good utility functions, regardless of which user-category we fit into. None of the house-keeping programs I have seen are sufficiently convenient to use, or flexible enough, to meet my needs. It was a pleasant surprise to find that the *WinBack* hard disk backup program is easy to understand and use, and does the job quite well, without forcing the user to jump through a hoop by involving him/her in a complex interface. No need for a mouse, no masses of keypresses, no massive memory demands, a simple and clear book of instructions; what could be wrong with it? It does have some limitations, but they are not that great, and later versions should overcome them. The program writer's



# SHOOTER

M S O L V E D

name was not previously known to me, which makes it even better that the program is worth having. It is desirable to have some new programmers on the scene, to fill the gaps left by those who have gone other ways in recent years.

You don't see much mention of the Z88 computer in these pages, which is rather a pity, as it is a very useful little computer, and it is one of Clive Sinclair's brain-children also. It is usual to see at least one stand of Z88 supporters at the All Formats computer fairs, and there are quite a few programmers beaver away to produce all the little goodies needed for the Z88. Being a portable machine, it needs links to other types of computer, and it is well provided for in this respect.

There is a good link program to the QL, and another to the PC. A good example of the usefulness of the Z88 was the job a QL using friend did recently. He wrote a report on (one of) his Z88 while on-location in Brazil, and then brought the report back here stored in the machine. We used a link program to transfer the text file to a PC, and a format-conversion routine (supplied with the conversion program) to put the text into suitable form for loading into the WordStar word processing program, on a PC. A disk was then sent back to Brazil for incorporation into a larger document, being prepared on a PC.

The same process can be used to transfer text files to QL *Quill*, *text87* or *Perfection*, although there is then no need for the rather odd conversions required with WordStar. The *Pipe Dream* text format from the Z88 can be used without conversion, but it is then necessary to make use of the Search and Replace facility within the receiving WP program to get rid of some unwanted characters.

An odd point to note from Kaga-Taxan users who have bought a laser printer is that it is preferable to use the FX-80 driver of test<sup>87</sup> rather than the Canon one, when printing on the laser in its FX-80 emulation mode. Some errors in alignment apparent

in the samples included with a recent article appear to have been due to using the Canon driver, which has some functions which are not standard to the FX-80. The sample given here was done with the GQ-500 laser driver, to show how well proportional spacing and justification is handled.

In the March issue, **Edward Jones** enquired about adding a second hard disk drive to his Thor. He mentioned Rodime as a possible supplier, since the original Thor drives came from them, but that company does not seem a suitable one to contact for a single drive now, partly because of the continuing financial problems

## Readers Letters

the company has but mainly because it deals with OEMs (original equipment manufacturers) and its units are not usually seen for sale to the general public.

The Thor used an SCSI interface, allowing several devices (of different types) to be chained together. You can buy SCSI drives from several suppliers who advertise in PC magazines, but there might be some risk of incompatibility, depending upon the degree of faithfulness with which CST/Rodime and current drive suppliers followed the SCSI specification. Another potential problem area is the use of termination packs on drives; presumably, the Thor requires packs on some drives in the chain, but not on others. SCSI drives tend to cost more than standard, MFM/RLL, drives.

We advise users to buy products with credit cards because there is a reasonable chance of getting a refund from the card company if ordered goods do not turn up or are defective. You do need to make a claim against the card company within a fairly short period of time; don't leave it six months or more. What prompts the reminder now is another complaint about non-delivery of a keyboard, ordered from **Keyboard Products**. The delay for

**David McCullagh** had been seven months at the time he wrote to us (March this year). He is one of several people to make similar complaints. This supplier has so far failed to respond to requests for information on four other orders (but two of the purchasers have reported finally receiving keyboards).

**Michael Jackson** is one of the users who finally got a working keyboard from Keyboard Products. He reports that the first one received appeared to be 'a complete dud', but the current one works well. There have been some problems, such as unexplained system crashes. The crash problem may have been solved by the use of an anti-static mat under the new keyboard. The interface which has to be installed inside the QL is apparently sufficiently large to cause conflict with other add-ons, such as Minerva. The alternative keyboard interface, supplied by **Jürgen Falkenberg** (reviewed by Mike Lloyd a few months ago, and available from EEC Ltd) leaves more space for other interfaces to be fitted. Falkenberg is the supplier of the scanner which attaches to a printer; this also was reviewed favourably by Mike Lloyd, and is available from TK Computerware.

**Anthony Magnus** from the Balearic Islands is yet another reader to report difficulty obtaining a PC keyboard and interface from **Keyboard Products**. His order was placed in mid-September last year, he sent a reminder in early February this year, and he was still waiting when he wrote another in late March.

Jackson brought up the subject of the KBL 128 computer box, also supplied by Keyboard Products. Such a box is a good idea, but this particular one is too small to accommodate a typical collection of system devices, such as the QL plus a couple of floppy drives, maybe a hard disk drive, disk/memory interface. No doubt larger boxes can be obtained, but not in the form of kits made up specifically for the QL user. If you go to Quanta group meetings, you will see all manner of assemblies of QL's into boxes, some being quite neat and others rather messy, but the average user most likely has neither time, ability, nor inclination to do a fully DIY job like this. There is a small market area here for an enterprising one-man company to make some money.

Returning the David McCullagh (who must keep a Thor running permanently for

This text was written using *text<sup>87</sup>* and printed with the driver for the Epson GQ-5000 laser printer. It is left- and right-justified, and the printer font is the scaleable Epson Times, in 12-point size. The range of sizes available is 6-72 points. At small point-sizes, it may be preferable to use the Epson Helvetica, which is sans-serif -- no "tops and tails" on the character-ends -- and is also scaleable. The lack of embellishments on the characters improves readability, although the impression given may not be as "professional" as with Times. The caption below is in 12-point Helvetica Bold Underlined. You can also use the other resident fixed-height fonts -- Prestige, Courier, Modern and EDP.

**LASER PRINT SAMPLE FROM TEXT<sup>87</sup>**



writing letters to QL World), he has been contacted by **Jacques Flury**, who was kind enough to supply him with both a monitor cable and a set of Argos 6.34 ROM chips for the Thor XVI, and is going to supply connection details for using the Miracle printer interface with the Thor. McCullagh has been advised not to expect any response from Thor International. To be able to add a hard disk to the Thor XVI, special chips are said to be needed; it might be worth having these chips manufactured and the Swiss supplier **COWO** (see address below) has suggested that it could do the job if they had about 20 customers for their 0.5-2.0 MB ram expansion units. They can also supply different versions of Argos, at about SFr. 100 each.

Back to the Serial 8056 printer again; **R Thompson** asks if anyone knows where to obtain continuous paper for this printer. We have been this route several times before, but I don't currently know of a supplier, so can anyone else offer names? Thompson is also in need of a manual for the printer; can someone supply a copy? The sample printout he sent had characters missing in several places, and some strange non-standard characters had been inserted at odd points. Missing characters are often a function of poor electrical connections between computer and printer, and the same fault can cause spurious characters.

Some very presentable prints of graphs (see illustration) were sent in by **Peter Hamill**. They were printed by a Tandy CGP-115 printer/plotter, from *Easel* data which had been saved to a ram file and then converted into a form suitable for the CGP. The routine for conversion was provided in the Quanta newsletter in November 1986, by J Stevens. The printer was quite cheap, but is out-of-production now; it might still be obtainable secondhand. If any other user needs help with graphs from this model, we can put him/her in touch with Hamill. The latter also mentioned an indexing routine for articles, documents etc, which is available (to Quanta members) from the Quanta library under the name *Indexer* (by Hugh Miall).

Reading a reader's letter reminded me

how contradictory are the impressions purchasers get of suppliers. Several people have said to me (and I've said myself) that **Miracle Systems** do not like answering letters; on the other hand, more people have given me instances of how helpful and generous Miracle have been in dealing with problems, going so far as to replace goods free-of-charge, and despatch goods without first requesting payment, in situations where there was no reason for the customer to expect to be treated so well. Longevity can generally be taken as a sign of reasonable customer service, in this business, and it is not by accident that **Miracle**, **Digital Precision** and **TK Computerware** have been with us for most or all of the QL's lifespan. There have been quite a few letters that I have written to suppliers over the past four years that have not received any answer, but I cannot recollect any instance where either D P or T K did not respond, and quickly.

The copy for the June issue had only just been sent off when **T K Computerware** called to say they had been contacted by **Mario Peer Bien** at the same time as he wrote to *QL World*, and that was the first they knew of his not receiving his cartridges. It is a bit late now (several months later) to start chasing the postal authorities about the package (which was despatched on 4th January last), but they will do so anyway. If the goods you order don't arrive, let the suppliers know about it within a reasonable time. Don't go to the extreme, though; one supplier called to say more than one customer had called at Easter time to complain about non-delivery of software *ordered during the previous day or two*, apparently quite oblivious of the fact that the postal service does not carry on as normal all through holiday periods (also, some people in business do like to take the odd day's holiday at such times). T K also commented that **K Blundell's** request for a replacement for his copy of *QSpell* was not being delayed by them, but had to be passed through other hands as well as theirs, since the program has not been sold for several years. It is only when a small batch of similar requests has accumulated that T K can get supplies of such out-of-

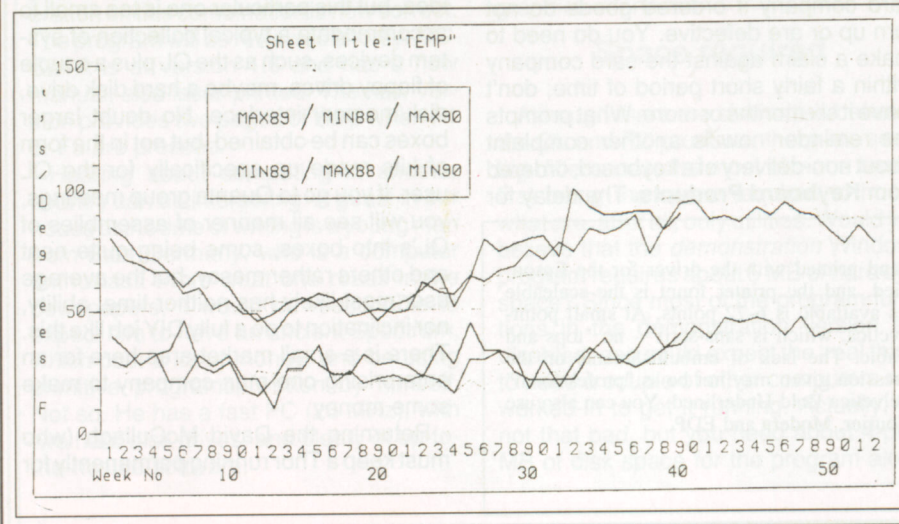
date items.

Hopefully, the change to a higher VAT rate will have passed without us having received a shoal of letters of complaint. Adverts placed before the budget — when suppliers had no idea the VAT rate was about to change — will have appeared with prices based on the old rate. Suppliers can't afford to pay the extra 21/2% themselves, on items supplied after the new rate came into effect, and they will be charging customers at the new rate. Bear in mind that advertisers (and magazines) can be held only to their advertised prices, not to the government's previous tax rate.

**Jens Wildgruber** wrote from Germany, about his experiences with *Minerva V1.82*. He is generally pleased with it, but has noted some incompatibility problems, for which he offered some 'work-arounds'. The SDUMP command on the Trump Card is disabled, unless another job is active in the background, and he suggests (for users of QPac) setting SYSMON or ALARM working. As noted previously, D P's *Turbo* won't start running with the usual CHARGE command, and you need to use EX\_PARSER\_TASK (or equivalent) to start it off. *Ultraprint* (also from DP) crashes when used with its original extensions, but is ok if *Turbo Toolkit* is used instead. Turbo-compiled tasks work in 1-screen mode, but not in 2-screen mode, unless a change of address is made in the compiled task; he suggests replacing the address \$28010 by (ver\$(-2)+16), starting at byte 178 and 278. Hope that means more to you than it does to me! Wildgruber ends his letter by expressing the hope that QView will now stop developing *Minerva* and concentrate on making it work with other QL software.

**CR Stephenson** has received a full refund for a QL returned to **EEC Ltd.** and says he accepts that the delay in getting his money back was entirely accidental. I don't recollect seeing any other complaint about this supplier, so this incident would seem likely to be a 'one-off'.

We never go long without receiving a letter about printing problems, and the latest one comes from **P Land**. He has a Citizen 124D, and gets double-spaced output from both Quill and Abacus, but single-spaced from programs obtained from the book *The Working Sinclair* (by David Lawrence). The obvious reason would seem to be that he has failed to use the Design screen in the Psion programs to set the Spacing to 0, although the default setting is 0 and he (or someone else) would have previously had to change the setting to 1 to give output such as in his letter. If you don't read the User Guide, or do some tests, the menu options can be confusing, and I can see someone inserting the wrong number for the right reason, so to speak. Another possibility is that his Printer\_Dat file(s) contains the command to give a Line Feed with every Carriage Return, and his printer may automatically do that anyway, with the result that there are two line feeds for every carriage return.





## All Formats

The next All Formats Computer Fair will take place at the New Horticultural Hall, Westminster, London on Saturday 22 June from 10am to 5pm. Tickets are £3. A new recorded information line about the fairs is open on 0898 299 389.

## THOR BULLETIN

Thor enthusiast Malcolm Smith has sent the first copy of *Mjolnir* – the Unofficial Thor Users' Magazine, from Norway, in his own words 'a simple, honest eight-page affair' containing letters in response to his original appeals for interest, some tips, and many queries. The bulletin is very simply produced by photocopier, but clearly printed and laid out (with the exception of one page which perhaps should have been retyped to save space).

*Mjolnir* looks to QL World like a simple and honest attempt to start a Thor self-help group which, from the comments we receive, is sorely needed. Malcolm tentatively suggests a starting subscription of £5 for four issues, and the pilot issue available for 40p. Norway, he points out, is more expensive than the rest of Europe, and we can confirm that it is not the ideal place to put down in at 11 o'clock at night with electrical problems and no hotel booking.

Contact Malcolm at **Statsrad Ihlensvei 66B, N-2010 Strommen, Norway**. No doubt he would appreciate an International Reply Coupon with general enquiries.

# A DUTCH TREAT

Dutch user group Sin\_QL\_Air report that the first Continental Pure QL Microfair in Eindhoven, Holland on May 6th went well.

CHM Biemans, Editor of the bulletin Quasar, writes: "Miracle introduced the Gold Card in the Netherlands, and Digital Precision's Freddy Vaccha held his inaugural Perfection speech, during the first Continental Pure Microfair in Eindhoven. In St. Joriscollege School in Eindhoven there were a considerable quantity of QL users from all over Europe, hoping to get the first release of DP's new wordprocessor Perfection. In the beginning it seemed like a speech about the whole of DP's list except Perfection, but after some hints that his time was up, finally the new WP was demonstrated and it looked so good that several users bought the test version straight away, to get the complete program delivered after some weeks.

"This type of lecture/demonstration was so popular that it will be continued at future meetings, where one or two producers of interesting programs will be invited.

"Cowo from Switzerland demonstrated the newly-re-named program QTop, with many utilities and multitasking features. This program also looked good and many visitors bought one after a clear audio-visual presentation.

"After the teach-in, there was a lecture from the Belgian Progs, with the recently developed DataDesign, which updated the previous QL World test of the program.

"The final lecture came from our own members about their QL-Unique system. It contains hotkey and multitasking configurations so that each user can devise a personal configuration to suit his or her needs. The club's promoter on this subject is Laurens Kremer, Magelerweg 53, 7683 VM Den Ham, Netherlands.

"The most surprising feature of the fair is the introduction and demonstration of the new Gold Card from Miracle Systems. This provides a QL68000 2MB with a speed of 12.16MHz, full 16-bit width, to fit into the QL's expansion slot instead of the Trump Card. It includes a battery-backed real time clock/calendar, and the disk drives

can handle 1.44MB or 3.2MB disks.

"Phil Borman of Quanta had been asked to bring copies of *The Definitive Handbook* by Jan Jones, and told us that about 20 had been sold. The charming team from EEC were there, and we are only sorry that they had only a few Keyboard-90 Interfaces available. Jurgen Falkenburg himself could not be there. We also missed Lear with their PCB-CAD program, and don't understand why there is not more publicity about this nice item, which we are sure many users would be interested in.

"Laurence Reeves of QView, together with TF Services, also had too few of the newest Minerva V1.89 roms, but they promised us that soon this new version will be ready for mailing, with the newest manual.

"We had a very good first continental fair in Holland."

Sin\_QL\_Air's foreign contact person is Marco Holmer, J P Coenstr. 61, 3531 EN Utrecht, Netherlands. **The Membership Secretary is Bob Visser, Snelrewaard 6, 2904 SN Capelle, a/d IJssel, Netherlands.**

## Archive Desktop Bug Probe

Robin Stevenson reports: "Several readers have had problems with the to-do list program from the Archive Desktop series, and the cause seems to be a bug in Archive. If Archive files are reset or selected, when the file has only just been created, under cer-

tain (as yet unidentified) circumstances, Archive goes haywire, and starts filling the drive with blank records.

To avoid this situation in the to-do list, the program should be modified so that there is never an empty file. Add the following lines to the end of

the 'TODOFILE' procedure. An 'end of file' record will be inserted when you create a new list file:

```
let DATE$ = '2099/12/31'
let DAYS = days (DATE$)
let TEXT$ = 'END OF FILE'
append
```

"My apologies to readers who have struggled with this. If anyone can shed more light on the bug, perhaps they could write to *Open Channel* with details."



*More memory, more speed and*

# GOLD CARD

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At the heart of the GOLD CARD is a 16 MegaHertz 16 bit 68000 processor chip which accesses its own 16 bit wide zero wait state RAM. With a typical program this combination leads to a speed increase of between 3 and 4 times when compared with the QL expanded with zero wait state memory. Some of the GOLD CARD RAM is used to shadow the QL's own ROMs and RAM so that not all of the 2 Mbytes is directly available to the user. This shadowing does, however, mean that the operating system routines, the Superbasic interpreter and screen accesses are all sped up besides applications programs like Quill, etc.. Programs that speed up the QL's operation like RAM based Lightning, Speedscreen, Turbo etc. also receive a boost!

New disk capacities can now be accessed. As with the TRUMP CARD and other QL disk interfaces the GOLD CARD can use 720K (the QL standard type) and 360K Double Density (DD) drives. But now both 1.44Mbyte High Density (HD) as used on the PC/AT, and 3.2Mbyte Extra High Density (ED) drives can be connected to the QL system. On its own the GOLD CARD can access up to 3 drives of any combination and with the addition of the DISK ADAPTER (modified for GOLD CARD compatibility) 4 drives may be used. These higher capacity drives are the same as the 720K in their size and appearance but differ in the speed of data transfer: whereas DD disks transfer data at 250Kbits/second, HD goes at 500Kbits/sec and ED at 1Mbit/sec. Please note that to get these higher densities you must use a suitable drive and the appropriate diskette.

TRUMP CARD users will feel very much at home using the GOLD CARD because there are only a few new commands. The main feature added is the ability to have sub-directories on the floppy disks and RAM disks. This works in a similar fashion to those on our QL HARD DISK. Sub-directories are easy to use but should one not wish to make use of this facility it can be ignored.



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- ▶ **16 Mhz 68000 processor**
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One of the underused resources in the QL is the clock/calendar. When a GOLD CARD is plugged into the system there is no longer any need to type SDATE on power up every time. A long life lithium battery keeps a clock chip on the GOLD CARD ticking even when the power to the QL is off. The Superbasic keywords SDATE, DATE, ADATE, DATE\$, DAY\$ and the associated QDOS calls have been modified by the GOLD CARD to access this clock chip.

Another salient feature of the GOLD CARD is its compact size. The 2 megabytes of RAM, the 68000 processor, the clock and its battery, the multidensity disk controller and the ROM holding the software to run the card have all been carefully engineered onto a circuit board that fits inside the QL. The only part of the GOLD CARD that protrudes from the QL is a small heatsink. This stays fairly cool because the GOLD CARD actually consumes less power than the TRUMP CARD due to CMOS chips being used throughout. For increased reliability all processor address, data and control lines taken to the edge connector are buffered.

No special skill is required to use the GOLD CARD. It simply plugs into the expansion port on the left hand end of the QL and installs itself automatically on power up. The reset routine copies the contents of the QL ROMs into its own memory, patches the machine code for GOLD CARD operation and effectively runs the reset routine a second time. The

whole sequence takes less time than the TRUMP CARD reset. From then on the RAM size as seen by QDOS is 1920Kbytes, and processing speed is accelerated.

We have put a lot of effort into making the GOLD CARD compatible with existing hardware and software. It is, of course, compatible with our HARD DISK, floppy disks and CENTRONICS INTERFACE, and all the major QL software. If any incompatibilities come to light then we will endeavour to deal with them swiftly.

When you order the GOLD CARD send in your old expansion for a price reduction. We can accept one expansion only per GOLD CARD with payment as follows:

<b>TRUMP CARD 2*</b>	<b>£225 (£200 export)</b>
<b>TRUMP CARD 768K</b>	<b>£275 (£241 export)</b>
<b>TRUMP CARD 256K</b>	<b>£300 (£263 export)</b>
<b>EXPANDERAM</b>	<b>£325 (£284 export)</b>
<b>DISK CARD</b>	<b>£325 (£284 export)</b>
<b>RAM + Disk Interface</b>	<b>£325 (£284 export)</b>
<b>Other expansion</b>	<b>£350 (£305 export)</b>

*\*The TRUMP CARD 2 is easily recognised by the words 'TRUMP CARD 2' appearing on the pcb.*

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# THE NEW USER GUIDE

*In the fifth part of our New User Guide, Mike Lloyd looks at data statements in SuperBasic, and the usual data input sources; keyboard, microdrive and floppy disks.*

## SECTION FIVE

So far in this series all the information given to the computer has come from SuperBasic commands such as 'LET x = 4'. In real life, programs have to cope with data entered by users.

SuperBasic is extremely rich in keywords associated with obtaining data from a variety of sources. There are three main sources of data input available to Basic programmers: the keyboard, microdrive and floppy disk files, and from special data statements within SuperBasic programs themselves. The latter will be dealt with on another occasion.

The keyboard provides the most direct contact with the user, and often provides the most problems. Users are notoriously prone to typing in the wrong thing, so the only way to trust them is not to trust them at all.

Data files on microdrives or disks and data statements within SuperBasic programs can be relied on to contain valid information provided that the programmer has full control over what is placed in them. If they contain information written by users then it is usually best to treat their contents with caution.

Input to a SuperBasic program can be obtained using the keyword INPUT. INPUT is very closely related to the PRINT statement with which you are now familiar. At its simplest, INPUT is followed by a single variable name:

### INPUT

INPUT number

If the above line is typed in as a direct command, the cursor will flash on the next free line of the default window. Anything typed at the keyboard will appear in that window until the Enter key is pressed, at which point the computer will attempt to make the variable 'number' equal to whatever has been typed in. Try it out, and prove that the input has been accepted by typing the following command:

PRINT number

With luck, the output from the PRINT command will be identical to the input from the INPUT command. However, if what you typed was not a valid number the computer will respond with an error message, and if you typed a very large or a very small number the computer will have displayed the result in scientific notation. Sticking to numbers with less than six digits will avoid the distraction of scientific notation for the moment.

INPUT's similarity to PRINT shows in the way that it can be preceded by an AT statement to determine where on the screen the input line will appear; it is affected by PAPER and INK statements; a channel number can be included in INPUT statements; and any number of inputs can be obtained provided that each variable name is separated by a valid print separator. It is therefore possible to write code such as:

```
AT#2; 4, 7  
PAPER#2, 5  
INPUT#2; A, B$, C
```

Basic's fondness of halting processing with error messages is one of its biggest weaknesses, and nowhere is this more irritating than in the way in which Basic objects to invalid data entered in response to INPUT commands. Fortunately, INPUT statements can also accept text data simply by using string variables, such as:

INPUT text\$

No matter what is typed into a text variable the QL will never complain that the input is invalid, so it is a good rule always to use string variables with INPUT statements. If necessary, numbers can be converted, or more properly 'coerced', from text format to the computer's internal numeric format. This is demonstrated by the following program fragment:



## COERCION

```
INPUT text$
LET square = text$ * 2
```

For coercion to work properly the string must begin with a valid number, for example it might read "123 High Street", otherwise we are back to an error message.

The simplest way to obtain trouble-free numeric input has been published in *Sinclair QL World* previously. The trick is to add a leading zero to all strings before coercing them. **Listing one** shows exactly how this can be done by rewriting last month's multiplication table program so that it accepts input from the user before printing a table.

### LISTING 1 - MODIFIED MULTIPLICATION TABLE

```
100 PRINT "MULTIPLICATION TABLE"
110 INPUT "Enter number "; INFO$
120 LET NUMBER = "0" & INFO$
130 IF NUMBER = 0 THEN STOP
140 CLS
150 LET COUNT = 1
160 PRINT NUMBER; " x "; COUNT; " = ";
170 PRINT NUMBER * COUNT
180 IF COUNT = 12 THEN GOTO 100
190 LET COUNT = COUNT+1
200 GOTO 160
```

As you begin to develop programs requiring user input, the following sequence of statements will feature regularly in your programs:

```
PRINT "Enter your name"
INPUT name$
```

Computer language developers have added an extra facility to the INPUT command to assist in this circumstance. You can put text strings into an INPUT statement which will be printed out prior to the cursor appearing for input. The two lines above can be encapsulated in a single INPUT command such as:

```
INPUT "Enter your name" \ name$
```

You should by now be well acquainted with the associate between the keyboard and input on the one hand and screen windows and output on the other. Communication between the computer and these devices is by means of 'channels', which can be imagined as conduits for Ascii characters. The concept of channels is central to the way the Qdos and SuperBasic make communications easy within any QL system.

When the QL is switched on three channels are opened by default, one for each of the screen windows. As a special arrangement for typing commands the keyboard is initially associated with the #0 window, also known as the command window.






When an INPUT statement is used, the keyboard is temporarily attached to the #1 window, aka the default window. If the INPUT statement includes the #2 channel identifier, the input appears in the #2, or listing, window. As we will soon learn, channels can also be opened to a printer and to files on microdrives and diskettes.

To open other windows new channels are designated with the OPEN command. OPEN must be followed by a channel number and by a device identifier. The identifier can be extended if necessary to include all sorts of extra information which will where possible be avoided in order to keep things simple.

The five device identifiers commonly used on QLs are listed in **Figure one**, although QDOS recognises a sixth, NET, which is used to connect QLs together in a network. Third party manufacturers have extended QDOS to recognise devices not originally included in the basic QL. The best examples are the now ubiquitous FLP1\_ and FLP2\_ device names for floppy disks.

## OPEN

### QL DEVICES AND DEVICE IDENTIFIERS

	scr_ (INPUT not allowed)
	con_ (INPUT allowed)
	ser1_ & ser2_
	flp1_ & flp2_
	mdv1_ & mdv2_

There are two types of screen window. Windows opened as consoles allow the INPUT command to be used in association with them, but windows opened as screens do not permit INPUT to be used. All three default windows are consoles.



A printer can be attached to the QL via one of the two serial port sockets at the back of the computer. Serial ports are so called because each of the bits of a byte of information are passed one after the other down a single wire, in serial fashion. The alternative arrangement is to have the bits of each byte travel simultaneously down eight wires, ie in parallel.

All QLs have two microdrives units fitted to their superstructure to allow files to be saved and accessed. When a channel is opened to a microdrive it is connected to a named file on a microdrive cartridge loaded onto the specified microdrive.

These days, many QL systems include one or two floppy disk units. Floppy disk drives are much faster and more reliable than microdrives, and floppy disks hold about seven times more information than a microdrive cartridge. Floppy disks are also extremely cheap, working out at around 75p per megabyte (roughly 1,000 kilobytes or a million bytes) whereas £20 worth of microdrives are needed to hold the same amount. Of course, before switching to floppy disks the cost of the disk drive must be considered, but the QL becomes a much more useful, responsive, reliable and fast machine with a disk drive attached.

If a new screen window was required, one which needed to accept INPUT commands, it could be opened with the following command:

```
OPEN#3, con_
```

The window will have default values for its size and colour which can be changed with appropriate commands, such as:

```
WINDOW#3, 140, 20, 10, 10  
PAPER#3, 2  
INK#3, 0
```

There is no requirement to open channels with consecutive numbers, although to do so is usually a good idea. It is also advisable to re-use channels, simply by opening them as a new device. Novices often fall into the trap of unnecessarily opening large numbers of windows at various screen locations. A more economical approach is to have just one window channel which can be relocated to suit what is being printed at the time.

In order to use a printer in SuperBasic a command such as:

```
OPEN#5, ser1_
```

must be used.

More often than not the device name needs extending to include essential parameters so that the computer and the printer are synchronised. Additionally, the speed of data transmission might need to be changed using the BAUD command, but these refinements will be discussed in a later part of the *New User Guide*.

Once a printer channel is open, the PRINT command can be used to send data to the printer, for instance:

```
INPUT "Type your name.", name$  
PRINT#5, "Your name is "; name$
```

Some commands associated with screen channels, such as PAPER and INK, have no effect on the printer AT and CLS and all of the graphics commands are also prevented from reaching the printer. A useful substitute for AT which can be used with printers and screen windows is TO, which moves the print position to a specified character position on the current line. In SuperBasic TO is embedded in a PRINT statement, as in:

```
PRINT#5, "This is the"; TO 20; "20th tab stop"
```

TO cannot be used to move the print position to the left of its current location or to the right of the window or page print area.

Programs can be listed to the printer by adding the appropriate channel number, such as:

```
LIST#5
```

Sometimes the last line of text sent to the printer will not be printed because it is held in a memory location called a buffer until some more text comes along to shunt it to the printer. It is possible to force the last few characters out of the buffer by closing the channel to the printer. Unsurprisingly, the keyword is CLOSE and the format for the command is:

```
CLOSE#5
```

By the way, it is a good idea to get in the habit of always using the same channel number for the printer.

Information is stored on microdrive cartridges and floppy disks in files. A file can contain a SuperBasic program, commercial software such as Psion Quill, data such as a word-processed file or some spreadsheet figures, or a representation of a screen display.



To open a new file using SuperBasic, a command from the OPEN family is followed by the name of the device and the file itself, eg:

```
OPEN_NEW#4, mdv 1_demofile
```

Once the file has been opened it can be written to using the PRINT command in exactly the same way as PRINT has been used for screen windows and the printer.

```
PRINT#4, "Here is some stored text"  
PRINT#4, " - and a second line of text"
```

As was the case with the printer, such incidentals as colour information and the AT command cannot be used with files.

Once you have finished writing to the file it can be closed with the CLOSE command:

```
CLOSE#4
```

It is extremely important to remember to close all channels linked to files before switching off the QL or removing the microdrive cartridge or floppy disk from its drive. If a file is open when the QL is turned off its contents will almost certainly be destroyed, and other files on the same medium may no longer be accessible. If you accidentally remove a file medium without closing channels connected to you can usually avoid disaster by re-inserting the correct medium. However, there is no substitute for rigorously following this advice:

## CAVEAT!

### ALWAYS CLOSE FILE CHANNELS

File contents are accessed by connecting them to a channel with one of two keywords from the OPEN family: OPEN or OPEN\_IN. OPEN allows both PRINT and INPUT commands to work, but OPEN\_IN only allows INPUT commands to be used, thus protecting the contents of your file from being overwritten by the accidental use of the PRINT command.

It is good practice, at least for the time being, to use OPEN\_IN rather than OPEN to read back information from files. You would only use OPEN to write to files which already exist and which contain data you no longer want to keep. To retrieve the two lines of text sent to the file above and print them on the screen, the following commands are required:

```
OPEN_IN#6, mdv 1_demofile  
INPUT#6, text$  
PRINT text$  
INPUT#6, text$  
PRINT text$  
CLOSE#6
```

Points to note are the choice of OPEN\_IN as the safest way of accessing a file for read-only operations, the use of INPUT to read back each line from the file and the CLOSE statement at the end of the sequence. The program as it stands is fine for a two-line file, but for longer files some sort of loop needs to be developed containing the INPUT and PRINT statements.

While it is possible to save a program listing like this:

```
OPEN_NEW#3, flp 1_program  
LIST#3  
CLOSE#3
```

it is rarely a good idea.

SuperBasic includes a single command called SAVE which does all of this. The equivalent SAVE command to the sequence above is simply:

```
SAVE flp_1 program
```

To retrieve the program into memory again, type:

```
LOAD flp1_program
```

Once the program has been loaded it can be LISTed, EDITed and RUN. Alternatively, if all you want to do is run the program, type:

```
LRUN flp 1_program
```

LRUN is shorthand for 'LOAD and RUN'. SuperBasic programs can be 'daisy-chained' so that each program loads its successor by including a LRUN command in the program. However, it is a rule that only one SuperBasic program can be in the QL's memory at one time, so both LRUN and LOAD have the effect of wiping out any program already in memory.

## SAVE and LOAD

## LRUN



# Be Reconciled

Nigel Bates makes personal finance into an Abacus tutor.

The value and usefulness of the QL and of the software available for it is tempered by the degree of simplicity with which that software available can be made to run smoothly. While there are undoubtedly several examples of good software to help keep track of one's personal finances and even those of small businesses, many people would be satisfied with a simple but effective application which did not require hours studying the manual or elaborate setting-up procedures.

The beauty of the Psion programs and the testament to their continued usefulness is the ease with which data can be entered into them and useful information obtained immediately. While a very substantial number of articles have appeared describing various uses for Archive, its close relative Abacus has tended to receive less attention until recently.

## Reconciliation

The following is a simple one-screen application to enable reconciliation of bank statements with cheque-book records. There will be those that have got such a tight control of their personal finances that they will have invested in a much more comprehensive piece of software to do this and other things for them. But, for quite a number of people, some simple, straightforward method of carrying out this regularly-occurring procedure would be very welcome.

Where do you begin if you decide to attempt a reconciliation? What do you make of all those standing order payments, cash machine receipts, cheque stubs, bank charges – or bank interest if you're the thrifty type – and countless other details of the average current account/ At first

sight, it's not obvious and, unless you are an accountant or bookkeeper, you probably may not be able to devise your own system to reconcile your version of things with the bank's.

Some years ago, I had an account with one of the smaller banks which provided statements on the back of which was a detailed set of instructions on how to carry out a reconciliation. I'm surprised that all banks do not provide such a useful service. I decided to adapt this to the QL. I choose to use Abacus rather than program in SuperBasic as it is possible to achieve very useful results with a spreadsheet in a fraction of the time it takes to program. And when you want to sort out your finances, the last thing you want is to get tied up in a loop!

The following Abacus application was one of the very first I developed back in the heady days of 1984 when the first QLs were rolling off the production line. I am still using it to reconcile my cheque book with my bank statement and I have found it absolutely invaluable. With the addition of extra memory, disc drives, Minerva and QPAC2, my six-and-a-half year old QL is now ten times the machine it was then, and beats the socks off most PCs!

A reconciliation is basically designed to match every item in your records with a corresponding entry in the bank's record, ie the statement. In actual fact, it is not in principle necessary to do any arithmetic at all, merely to tick off the items as they appear. In practice, however, because of the possibility of confusion between several similar items such as cash-dispenser withdrawals, it is better to keep a running total of the actual amount of all transactions. Also, because of the time it takes for cheques etc, to be cleared by the bank, the figure the bank regards as your

actual balance may never exactly match that in your records. Therefore, it is desirable to choose a definite point of time and attempt to match the cheque-book record with the bank statement by taking account of all other items which have been omitted in one and included in the other and vice versa.

This application was designed for someone who prefers to keep details of all bank account transactions on cheque-book stubs. Of course, it would be possible to use Abacus itself to keep a list of these details or even to modify the application described below to do so, but this would entail a necessary degree of complexity which would compromise the principle of ease of use. In practice, as long as we continue to use cheque-books, this seems to be the most logical place to maintain a current record. If the day ever comes that all transactions are carried out electronically, then the application could be modified to take account of this.

## Full records

To be able to use the application you will need to start getting into the habit of keeping full records of all the financial transactions on your bank account by collecting all those cash-dispenser slips which, previously, you may have thrown in the bin. Unless you are the type of person who can remember every penny you have spent and fifteen birthdays in your head at the same time, make a list of Standing Order or Direct Debit mandates on your bank account on a sheet of paper. Use your previous statements to help fill in the gaps in your memory. Keep this sheet for reference purposes and update it as soon as changes occur in the details. Make sure you always write up all cheque stubs fully as you make them out. Later, write into your cheque stubs at the correct places details of all other withdrawals and deposits made by you between the dates of the cheques. I find it useful to use a sharp pencil and to write the details in code form, eg 12/10 -20.00 CD (£20 withdrawn by cash-dispenser on 12th October) or DD (Direct Debit) as necessary or make up your own. Even on a cheque stub, it is amazing how much information you can fit.

Obviously, at the start, you will not have a previous reconciled balance with which

```
F3 :C[+0]R[-3]+C[+0]R[-2]
F12 :askn(C[-1]R[+0]+ " ")
F17 :askn(C[-1]R[+0]+ " ")
F19 :-askn(C[-1]R[-0]+ " ")
F20 :C[+0]R[-3]+C[+0]R[-2]
F25 :C[+0]R[-3]+C[+0]R[-2]
F35 :rept("=",width())
F37 :askt("Enter month ")
F38 :rept("-",width())
F39 :rept("-",width())
F40 :sum(C[+0]R[-10]:C[+0]R[-2])
F41 :1F(abs($E19-$E10)>=0.005,"NOT RECONCILED","RECONCILED")
F52 :- $B17
F56 :C[+0]R[-3]+C[+0]R[-2]
```



to begin. You will have to accept the bank's version of events and use the final balance of the most recent statement you have received. Write this figure in, again in pencil, somewhere near the top of the cheque-stub whose date follows the date of this balance. Subtract from this balance the amounts of any withdrawals and add to it the amounts of any deposits whose details you have written in. Don't worry if you think you have not remembered everything. In any case, you will not know beforehand how much interest on your account you are due or, if you are not so lucky, how much in bank charges you have to pay. They need only to be taken account of in the month of the statement on which they appear; and that statement will give you those details.

### Set-up

To set up the application, first press F2 to get full-screen display followed by F3 D A ENTER to turn off Abacus's auto-calculate on input. Set the default display of numeric data with the units command: F3 U D ENTER ENTER to give two decimal places. Change the column widths for each column with the grid command. Set column A to a width of 9 spaces by pressing F3 G W 9 ENTER A ENTER A ENTER. Change each of the widths of columns B to E in the same manner setting B to 8, C to 3, D to 30, and E to 8 spaces respectively. You may wish to blank out amounts in the spreadsheet which are zero by pressing F3 D B ENTER.

Enter the following formulae into the appropriate cells as given. Where text items are being entered, you need only type the first quote ("): Abacus fills in the other for you.

```
A2 "a/C No.:"
A4 "DEBITS OUTSTANDING"
A5 "Cheque No."
A16 rept("-",width0)
B2 "(Your own account no.)"
B5 "Amount"
B16 rept("-",width0)
B17 sum(B6;B15)
B18 rept("=",width0)
C1 "CHEQUE-BOOK AND
STATEMENT RECONCILIATION"
D2 askt("Enter month")
D4 "Cheque-book balance"
D5 "Statement credits not in recs."
D7 "Subtotal"
D8 "Less stmt. debits not in recs."
D9 rept("-",width0)
D10 "Adjusted cheque-book balance"
D11 rept("=",width0)
D13 "Final statement balance"
D14 "Add total lgmnts. not on stmt."
D16 "Subtotal"
D17 "Less 'DEBITS OUTSTANDING'"
D18 rept("-",width0)
D19 "Account balance"
D20 rept("=",width0)
E3 "£"
E4 askn(D4+""")
```

```
E5 askn(D5+""")
E6 rept("-",width0)
E7 E4+E5
E8 -askn(D8+""")
E9 rept("-",width0)
E10 E7+E8
E11 rept("-",width0)
E13 askn(D13+""")
```

	A	B	C	D	E	F
1:						
2:				F37		
3:						
4:					F12	
5:					F12	
6:					F39	
7:					F20	
8:					F19	
9:				F39	F39	
10:					F25	
11:				F35	F35	
12:						
13:					F17	
14:					F17	
15:					F39	
16: F38		F38			F56	
17:		F40			F52	
18: F35		F35	F39		F39	
19:					F3	F41
20:				F35	F35	

```
E14 ask(D14+""")
E15 rept("-",width0)
E16 E13+E14
E17 -SB17
E18 rept("-",width0)
E19 E16+E17
E20 rept("-",width0)
E19 if(abs(SE19-SE10)>=0.005, "NOT
RECONCILED", "RECONCILED")
```

To improve the appearance of the application, the text in cell B5 should be right-justified (F3 J ENTER ENTER R ENTER) and that in cells A17 and E3 should be centred (F3 J ENTER ENTER C ENTER).

### Automatic resize

The rept0 function is used to separate different parts of the spreadsheet by drawing lines of dashes and double dashes. The inclusion of the width0 functions in the formula means that the lines are resized automatically if the column-widths are changed. Two extreme useful functions in Abacus are askt0 and askn0. These effectively make an Abacus spreadsheet behave as if it were a SuperBasic program by generating prompted requests for data entry. Both may take text parameter or, as here, a reference to a cell containing text. When the spreadsheet is executed, Abacus will work through these functions presenting them as queries in the prompt line at the bottom of the screen with any text prompts they contain. In the case of askt0, you may press ENTER if there is nothing you wish to type in. With askn0, however, which expects numeric input, if there is no number to enter you must type zero (0) followed by ENTER otherwise Abacus will refuse to continue.

Save this as a file called CHEQBOOK\_aba

and use it as a blank template when starting out to do the reconciliation. You may have more than one account on which you wish to use it.

When the day of reckoning arrives and you receive your bank statement, don't be tempted to put it aside to deal with it late. If there are any errors on the statement –

and believe me errors do occur – you will want to inform your bank as soon as possible. In my own experience, I find the banks are getting better at correcting their own errors before they get through to you; and if there is a mistake on the statement it is not unusual to see a correcting payment further down the sheet.

### Statement dates

Note the date of the statement. You may, if you wish, carry out the reconciliation for any period you like; but I find it simpler to use the dates given at the beginning and end of the statement even if these do not correspond to a calendar month. Go through the cheque-book stubs for the period since the last statement and before the latest date of the present statement and tick off each debit which also appears on the bank statement. Any left unticked should have their amounts as numeric data. You can expand the space for this if you have a lot of debits outstanding, but you will need to move the formula in cell B17 further down and change it to cover the greatest range of cells; and you will also need to alter the formula in cell E17 which uses an absolute cell reference. Change it to refer to whatever cell you have moved the formula originally in B17 to.

Press F3 X to start eXecution. The program prompts you for the necessary information it needs. Make sure you enter all debts as positive amounts – the program will put in the signs for you. However, if either the starting cheque-book balance or the final statement balance are negative, ie overdrawn, then enter these with a minus sign in front of them.

Abacus will ask you to type in the month in question. This is merely for record



purposes. The heart of the program is in two parts, the first of which basically corrects the deficiencies in your record keeping by including those unexpected items that have appeared on your bank statement, and the second part corrects the deficiencies of the bank statement by adding on deposits that you have made which have yet to be cleared before they appear in the bank's records.

## Estimate

The program asks you for the balance you have estimated in your cheque-book up to the date of the statement. This is the figure you will have written in pencil at the bottom of the latest cheque-stub before the statement date and corrected for any later transactions of other types that may have occurred. The program then asks for the total amount of any credits that have appeared on your statement that you have not taken account of in your cheque-book record. This could include bank interest, money paid into your account from other accounts, etc. Next, you are asked for the

records but which have not appeared on the statement. Enter this value in response to the prompt. Lodgements you know of made by other people into your account are probably best left out of the reckoning for the present. They will appear on the following month's statement and you will take account of them under the 'Statement credits not in records' query of cell E5.

## Comparisons

Abacus then goes away and does its sums. If every conceivable item has been included correctly, the figures in cells E10 and E19 will be identical and cell F19 will show the word RECONCILED, otherwise it will say NOT RECONCILED. This is an interesting example of the use of the if0 function in Abacus. The program compares the difference in the values of the contents of the two cells to see if it is greater than or equal to £0.005, ie a halfpenny. If it had been asked to check that they were exactly equal, then it would almost always be NOT RECONCILED as Abacus calculates its numbers to sixteen places of decimals

that it was not included in the cheque-book balance entry in cell E4. If the number calculated in cells E10 and E19 are different, the difference between them may well reveal what item has been omitted from your records, especially if it is an odd amount such as a cheque. If there are several items, it may not be so easy; but in any case, if you continue keeping records, you will be able to achieve a full reconciliation on your next statement. A most unfortunate situation to find yourself in would be if the bank had actually themselves made an error on the statement you first tried to reconcile! After much head-scratching and frayed nerves, you might eventually become convinced of the usefulness of the program.

## Cash withdrawals

In fairness to my present bank, I have to say that it has always been me that has been wrong and not my bank statement. Perhaps others have not been so well served! It usually comes down to a missed cash withdrawal such as the time the cash dispenser ran out of printed receipts and you forgot to make a note of it in your portable organiser! Having carefully kept all such receipts, I can truthfully say that, with a little checking, I have never failed in over six years to reconcile my own records with my bank statement.

## No need to scroll

The program is designed in such a way as to make it unnecessary to scroll around the spreadsheet or to use the Abacus window facility. Once you have satisfactorily reconciled your records with the bank statement, you may save the information as an Abacus file in the usual way, and print it out if you wish. I use a file name such as CHBK0CT\_aba to refer to my October cheque-book reconciliation. Once reconciled of course, when you come to use the program on your next statement, you can load the previous month's file and remove the details of those outstanding debits (use F3 R) that now appear on the latest statement and add in any new ones that have arisen. Then you can save the new information with a different name and delete the old file. In this way you need only have one Abacus file saved on your disk or microdrive at any time. If you do wish to keep all reconciliation data files, then use unique filenames such as CHBK0190\_aba for your January 1990 file, for example.

In all the years I have been using this program, the feeling of satisfaction brought about by the appearance of that heartwarming word 'RECONCILED' on the screen at the end of my labours has been immeasurable and has given me great confidence in the many dealings I have had with my bank. I trust it may also be of service to you.

CHEQUE-BOOK AND STATEMENT RECONCILIATION			
A/C No.: 12345678		OCTOBER '90	
4	DEBITS OUTSTANDING	Cheque-book balance	212.79
5	Cheque No. Amount	Statement credits not in recs.	6.79
6		Subtotal	219.58
7	000123 21.75	Less stat. debits not in recs.	-8.00
8	000125 20.40		
9	00 8 Oct 10.00	Adjusted cheque-book balance	211.58
10	000126 33.83		
11	00 16 Oct 20.00		
12		Final statement balance	292.39
13		Add total ldgmts. not on stat.	25.17
14			
15		Subtotal	317.56
16	Total 105.98	Less 'DEBITS OUTSTANDING'	-105.98
17		Account balance	211.58 RECONCILED
18			
19			
20			

CELL A1    CPU USE A1:F20    MEMORY 453K  
CONTENTS EMPTY

value of any debits which appear on your statement but which also you have not taken account of in your cheque-book records. This will include bank charges, card fees, and any standing order or direct debit payments which you have forgotten to include in your own records or any cheques written before the date of the first reconciliation which have only now appeared on your statement.

The program then asks you for the final balance from your bank statement. There is one remaining item to complete the picture. It is the total value of any cash/cheques that you have lodged and taken account of in your own cheque-book

and would only by chance ever get them exactly equal.

## First attempt

At this stage, it is quite possible that the program is telling you that things have not been reconciled! When testing this application out for this article, by pretending that I had not been keeping a full set of records, I got very close on the first attempt. The problem turned out to be a cheque which had been written some weeks before the date of the account balance that I had decided to start with. This meant



# DIY TOOLKIT



Simon Goodwin digs out more hidden Qdos extensions and reveals the most versatile DIY keywords yet.

This month's *DIY Toolkit* project introduces five new SuperBasic keywords: MTRAP, QTRAP, BTRAP, ADDRREG and DATAREG. These provide direct access to the hidden features of Qdos used to implement tasks and SuperBasic commands.

Qdos is the collection of machine-code routines that give the QL its unique character. The kernel of Qdos is built-into the computer, but programs and devices can add more.

Qdos facilities range from simple things like character input and output to hard-disk maintenance calls undocumented in Qdos books or Sinclair's Technical Guide.

Most of the facilities of Qdos are controlled by TRAPs – concise 68008 machine-code instructions that switch the processor into 'supervisor mode' and divert execution to system software.

TRAP #1 calls 'manager' routines that deal with the allocation of tasks, devices and memory. TRAP #2 can open and close channels, format drives and delete files. Once a channel is open, operations use TRAP #3, the 'I/O utilisation' trap.

More than a hundred management and channel use routines are built into every QL or Thor rom, designed to be called from machine-code using TRAP instructions. Most books on Qdos list the traps and their parameters; I use Andy Pennell's *QDOS Companion* and Adrian Dickens' *QL Advanced User Guide*. Similar information has appeared in other books, articles and the *QL Technical Manual*.

There is not room to list all the standard routines here, although I shall give examples of some that are not normally accessible from SuperBasic. The full set is tabulated, with examples, in the new *DIY Toolkit*, Volume T for Traps.

I have planned a set of 'general' Qdos access routines for years, but deferred the task while waiting for details of new TRAPs and considering the development

of further specialised routines. I was impressed by the Thor's IO\_TRAP keyword, and decided to go ahead with a *DIY Toolkit* set after comments from Lisbon's Tiago Freitas Leal in letters to *QL World* and *Quanta*.

## Timeouts

Tiago argued for standard Basic TRAP routines, pointing out that some features of Qdos, like timeouts, are not supported by existing Toolkits. "If these Toolkits did include extensions for all possible Qdos traps, they would grow beyond the eprom size, or take too much ram." My generalised Trap keywords need less than 400 bytes.

The new commands are general-purpose, and rather arcane by *DIY Toolkit* standards. The five extensions can handle a total of 21 parameters between them – but sensible defaults are set so you can get by with something as simple as MTRAP 0, to read the Qdos configuration, or QTRAP #0, 21 to move the cursor up a line.

My routines concentrate on TRAP #1 and #3 calls. They are hidden, numerous and useful, while other rom routines are already accessible to SuperBasic programmers. The standard CALL allows the use of vectors. TRAP #2 routines are well served by CLOSE, DELETE, FORMAT and many variants of OPEN, including the pipe commands QLINK and CONNECT.

Qdos is an extendable system, so add-on programs, roms and devices can add extra TRAP facilities. For instance, Sinclair roms lack facilities to rename or truncate files; these were added by Tony

Table: Qdos late arrivals:

TRAP #1			
MT. TRA	\$24	Set translate tables	(JS/MG)
MT. ???	\$25	Sinclair assigned, unknown	(JS/MG)
MT. LTHNG	\$26	Link a Thing in Ram	(SMS-2)
MT. RTHNG	\$27	Remove a Thing	(SMS-2)
MT. UTHNG	\$28	Use a Thing	(SMS-2)
MT. FTHNG	\$29	Free a Thing	(SMS-2)
MT. ZTHNG	\$2A	Zap a Thing	(SMS-2)
MT. NTHNG	\$2B	Next Thing	(SMS-2)
MT. STHNG	\$2C	Next Thing user	(SMS-2)
TRAP #3			
SD. ROP	\$37	Screen raster operation	(Sinclair)
SD. DOT	\$38	Set points, pixel coords	(Sinclair)
SD. LINEP	\$39	Draw lines, pixel coords	(Sinclair)
SD. TOPW	\$3A	Bring window to top	(THOR)
FS. RENAME	\$4A	Rename file, A1 -> New name	(TK2/QFLP)
FS. RENAME	\$4B	Truncate file	(TK2/QFLP)
FS. DATE	\$4C	Set/Read file dates	(CST/Miracle)
FS. MKDIR	\$4D	Make file into directory	(THOR)
FS. WATER	\$4E	Read Thor 'watermark'	(THOR)
FS. VERS	\$4E	Set/Read file version	(Miracle)
FS. XINF	\$4F	Read Drive details	(Rebel/Miracle)



## Listing 1

```

* QL WORLD DIY TOOLKIT - Direct Qdos TRAP access routines
* Version 0.9, Copyright 1991 Simon N Goodwin
*
initialise lea.l define,a1 A1 -> extension details
           movea.w #110\w,a2 Fetch BP.INIT word vector
           jmp (a2) Add these extensions
*
* MTRAP TRAP1_KEY [ ,D1 !,\JobNum ] [ , D2 , D3 , A0 & A3 , A1 ]
*
mtrap      cpa.l a3,a5 At least one parameter?
           beq.s bad_param If not, moan at once
           moveq #112,d5 Separator bit mask: 01110000
           and.b 1(a3,a6.1),d5 Read the first separator
           sub1.b #48,d5 Binary "\ " pattern: 00110000
*
* D5 is Zero if the (assumed) first parameter separator is "\ "
*
           movea.w #118\w,a2 Fetch CA.GTLIN vector
           jsr (a2) Get long integers
           bne.s bad_return Give up if fetch fails
           cmp.w #6,d3 Too many parameters?
           bhi.s bad_param bad_param
           movem.l 0(a1,a6.1),d0/d1 Pick up a couple
           tst.b d5 Job Number parameter?
           bne.s get_regs
*
           move.l d1,d5 Save the Job Number in D5
           moveq #0,d0 MT.INF trap key
           trap #1 Find the system variables
           move.w d5,d1 Make ID from the Job Number
           swap d1 Prepare to receive the Tag
           lsl.w #2,d5 Scale offset for long words
           add.l 104(a0),d5 Add job table base offset
           cmp.l 108(a0),d5 Check total against the end
           bge.s off_job Offset beyond end of table?
           movea.l d5,a0 Dn/An is not so orthogonal
           move.l (a0),d5 Pick up the Job base address
           bmi.s off_job That Job is not running!
           movea.l d5,a0 A0 points to the job header
           move.w 16(a0),d1 Copy the tag from JB.TAG
           swap d1 D1 = TAG:NUM = Qdos Task ID
           move.l 0(a1,a6.1),d0 Restore first parameter D0.L
*
get_regs   movem.l 8(a1,a6.1),d2/d3/a0/a1
           movea.l a0,a3 Help for MT.IPCOM
           trap #1
           lea.l regtable,a2 Store registers in table
           movem.l d0-d3/a0,(a2) N.B: A0 is saved by TRAP #1
           moveq #0,d0
           rts
*
off_job    moveq #-2,d0 Report "invalid Job"
           bra.s bad_return Route all errors one way
           not_open moveq #-6,d0 Report "channel not open"
           bra.s bad_return
           bad_param moveq #-15,d0 Report "bad parameter"
           bad_return rts
*
* BTRAP : QTRAP # CHANNEL%, TRAP3_KEY [ , D1, D2, D3, A1, A2 ]
*
btrap      moveq #1,d7 Addresses are inside Basic
           bra.s trap3 Lau might start there: "D7=0!"
*
qtrap      moveq #-1,d7 Indicate absolute addressing
           trap3 Fetch CA.GTLIN vector
           jsr (a2) Get some long integers
           bne.s bad_return Give up if that fails
           subq.w #2,d3 Too few? Minimum is A0 , D0
           bmi.s bad_param Channel & Trap Key needed
           move.w 2(a1,a6.1),d0 Get LDW word of parameter 1
           mulu #40,d0
           add.l 48(a6),d0 Add channel base offset
           cmp.l 52(a6),d0 Check it is within the table
           bge.s not_open
           move.l 0(a6,d0.1),d0 Pick up the Qdos channel ID
           bmi.s not_open Oops, the channel is closed!
           move.l d0,a0 Set A0 for the call
*
           subq.w #3,d3 D1, D2, D3 required?
           bpl.s get_set Yes - so read the lot
           moveq #4(a1,a6.1),d0-d2
           moveq #-1,d3 Default timeout -1, forever
           bra.s relatively No need to set A1 or A2
*
get_set    subq.w #2,d3 Too many parameters?
           bhi.s bad_param
           movem.l 4(a1,a6.1),d0-d3/a1/a2
           relatively tst.l d7 Is this a BTRAP?
           bmi.s all_set No: QTRAP is ready
           trap #4 Warn Qdos of A6 offsets
           all_set trap #3
           lea.l regtable,a2 Find register storage area
           movem.l d0-d3/a1,(a2) N.B: TRAP #3 saves A1
           moveq #0,d0
           rts
*
* Functions to read register values from the REGTABLE area
*
addreg     cpa.l a3,a5 No parameters expected
           bne.s bad_param
           moveq #16,d5
           bra.s default Continue as for DATAREG
*
datareg    clr.w d5 Default = D0, report code
           cpa.l a3,a5 No parameter?
           beq.s default
           move.w #112\w,a2 Get integer parameters
           jsr (a2)
           bne.s bad_return
           subq.w #1,d3 Just one parameter?
           bne.s bad_param
           move.w 0(a1,a6.1),d5
           cap.w #3,d5 Permit access to D0 .. D3
           bhi.s bad_param
           addq.l #2,#58(a6) Update BV.RIP stack pointer
           lsl.w #2,d5 D5 := D5 * 4 (LONG offset)
           default lea.l regtable,a2
           move.l (a2,d5.w),d0 Read stored register value
           * Make D0.L into a 6 byte decimal on the RI stack
*
return_fp  move.w d0,d4 D4.W will be exponent
           move.l d0,d5 D5.L will be mantissa
           beq.s normalised Zero is a trivial case
           move.w #2079,d4 First guess at exponent
           add.l d0,d0 Already normalised?
           bvs.s normalised
           subq.w #1,d4 No, halve exponent weight
           move.l d0,d5 Double mantissa to match
           moveq #16,d1 Try a 16 bit shift
*
normalise  move.l d5,d0 Take copy of mantissa
           asl.l d1,d0 Shift mantissa d1 places
           bvs.s too_far Overflow! must shift less
           sub.w d1,d4 Correct exponent for shift
           move.l d0,d5 New mantissa is more normal
           too_far asr.w #1,d1 Halve shift distance
           bne.s normalise Try shift of 8, 4, 2 and 1
           normalised moveq #6,d1 Six bytes please
           move.w #11A\w,a2 Check space with BV.CHRIX
           jsr (a2) No error return possible
           move.l #58(a6),a1 Get revised BV.RIP value
           subq.l #6,a1 Make room for one float
           move.l a1,#58(a6)
           move.l d5,2(a1,a6.1) Stack mantissa
           move.w d4,0(a1,a6.1) Stack exponent
           moveq #2,d4 Floating point result
           job_done moveq #0,d0
           rts
*
* N.B: Register values D0-D3 & one address, total 20 bytes,
* re-use the DEFINE table RAM space. Move REGTABLE for ROM!
*
regtable   define dc.w 3 Three procedures
           dc.w qtrap=#
           dc.b 5,'QTRAP'
           dc.w btrap=#
           dc.b 5,'BTRAP'
           dc.w atrap=#
           dc.b 5,'MTRAP'
           dc.w 0 End of procedures
           dc.w 2 Two functions
           dc.w datareg=#
           dc.b 7,'DATAREG'
           dc.w addreg=#
           dc.b 6,'ADDREG'
           dc.w 0 End of functions
           end

```

Tebby and others when the first disk systems appeared, and now work on micro-drives too, thanks to code added by *Super Toolkit 2* and *Minerva*.

QTRAP 74 lets you re-name a file on floppy and hard disk. A1 should point at the new name. QTRAP 75 truncates a file. *Minerva* and *Toolkit 2* extend the micro-drive handler to support these keys.

Current roms allow Trap keys between 0 and 127. My code passes a full long word so that it will work with future systems that may support thousands or millions of variations. Some of the less-well-known TRAPs are documented in the table.

Many readers will be interested in the new routines and trap numbers that have been added to control add-ons from *Miracle*, *Rebel* and *CST/Thor*. These can be

called with BTRAP or QTRAP, even if there is no new Basic command to use them, or you don't want to rely on the command that may be provided.

## Hard disk

Several new TRAP codes implement hard disk operations that are not supported by standard Qdos. Some of these work with other devices, like Tony Tebby's revised ST drivers, but parameters and results vary between *Rebel*, *Miracle* and *CST Thor* implementations, despite Chas Dillon's best efforts to encourage standards. I shall explain the variations as they have been explained to me, and welcome information about changes or extensions.

The most useful new traps are the group with keys between 76 and 79. Like all TRAP #3 routines these work on channels, identified by an ID in A0, with extra parameters in data registers.

FS DATE lets you read or set the three date fields in the header of a file. D2 indicates the date concerned: 0 for update, 1 for last reference, and 2 for the backup date. If you only need to read the date, set D1 to -1; on return D1 will contain the date, in seconds since January 1st 1961, to suit QL DATE functions.

Dates have been documented, but not implemented, in QL file headers since the launch. The standard 'GetHEAD' trap FS. HEADR can read these dates, but FS. HEADS has never been able to set them.

To set the current date, call FS. DATE



## Listing 2

```

100 REMark Sinclair QL World HEX LOADER v 3
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
150 CLS: RESTORE : READ Space: start=ALCHP(space)
160 PRINT "Loading Hex..." : HEX_LOAD start
170 INPUT "Save to file...":f$
180 SBYTES f$,start,byte : STOP
190 :
200 DEFine FuNction DECIMAL(x)
210 REturn CODE(h$(x))-48-7*(h$(x)>"9")
220 END DEFine DECIMAL
230 :
240 DEFine PROCEDURE HEX_LOAD(start)
280 byte = 0 : checksum = 0
300 REPEAT load_hex_digits
310 READ h$
320 IF h$="*" : EXIT load_hex_digits
330 IF LEN(h$) MOD 2
340 PRINT"Odd number of hex digits in: ";h$
350 STOP
360 END IF
370 FOR b = 1 TO LEN(h$) STEP 2
380 hb = DECIMAL(b) : lb = DECIMAL(b+1)
390 IF hb<0 OR hb>15 OR lb<0 OR lb>15
400 PRINT"Illegal hex digit in: ";h$ : STOP
420 END IF
430 POKE start+byte,16*hb+lb
440 checksum = checksum + 16*hb + lb
450 byte = byte + 1
460 END FOR b
470 END REPEAT load_hex_digits
480 READ check
490 IF check <> checksum
500 PRINT"Checksum incorrect. Recheck data.":STOP
520 END IF
530 PRINT"Checksum correct, data entered at: ";start
560 END DEFine HEX_LOAD
570 :
580 REMark Space requirements for the machine code
590 DATA 378
600 :
610 REMark Machine code data
620 DATA "43FA014434780110","4ED2BBCB67687A70"
630 DATA "CAS3E80104060030","347801184E926858"
640 DATA "B67C000682504CF1","0003E8004A056828"
650 DATA "2A0170004E413205","4841E54DAA80068"
660 DATA "BA8006C8282045","2A10EB2220453228"
670 DATA "001048412031E800","4CF1030CE082648"
680 DATA "4E4145FA00E248D2","010F70004E7570FE"
690 DATA "600670FA800270F1","4E757E0180027EFF"
700 DATA "347801184E9268F0","55436BEA3031E802"
710 DATA "C0FC0028D0A0E0030","B0AE00346CD42036"
720 DATA "0806BCE20405743","6A0A4CF10007E804"
730 DATA "76FF600A554362BE","4CF1060FE8044A87"
740 DATA "6B024E4444E4345FA","007E48D2020F7000"
750 DATA "4E75BBC866A07A10","60224245BBC8671C"
760 DATA "347801124E926890","5343668A3A31E800"
770 DATA "BA7C0003628054AE","0058E54D45FA0048"
780 DATA "2032500038002A00","671C363C081FD080"
790 DATA "69145344280F7210","2005E3A089049841"
800 DATA "2A00E24186F27206","3478011A4E92226E"
810 DATA "0058E5D82D490058","2385E8023384E800"
820 DATA "780270004E750003","FF3605154524150"
830 DATA "FF2A054254524150","FEB2054D54524150"
840 DATA "0000002FF760744","415441524547FF64"
850 DATA "0641444452454700","0000","*",32375

```

with D1 zeroed. Other values of D1 are treated as new dates to be set. This scheme suits the Rebel Hard Disk and early Miracle drives, but current Miracle models do not implement the reference date; the space is used to store a file version number instead.

IO. VERS takes and returns a parameter in D1. Zero simply reads the version number for the file identified by A0; -1 reads and increments the number. Other values set the version, between 1 and 65535.

IO. XINF reads full details of a hard drive into a 64 byte buffer pointed to by A1. After the call, with D1=0, the buffer contains the medium name, device name and number, followed by a non-zero flag byte if the drive is read-only. The next word indicates the number of bytes in each 'allocation unit'. It may range from 512 bytes to 8K or more, depending on the system.

The last three documented values are long words: the total number of allocation units available, the number free, and the length of the file header, usually 64 bytes. The standard FS. MDINF assumes a maximum of 65535 512 byte sectors, but IO. XINF allows drives to hold far more than 32 megabytes.

## Graphic calls

The TRAP #3 MT. ROP is mentioned briefly in Sinclair's Technical Manual, along with some apparently unreleased pixel graphics calls, akin to DIY Toolkit's PLOT and DRAW. IT seems that these traps have never been implemented. Argos 6.41 rejects them, reporting 'bad parameter'.

Minerva 1.64 rejects SD. DOT and SD. LINEP, and crashes if I call SD. ROP with QTRAP #2,55 – the rom jumps to \$C558, which reads an absolute address from \$28494 (somewhere in Screen 1, or the Supervisor stack), and tries to jump there. This causes the crash, as the address

(\$2F0063B8) is not valid. This is a strange bug, but hardly serious.

MT. TRA is the equivalent of the TRA (TRAnslate) command in later Sinclair roms. The next TRAP #1 key, 37, is reserved by Sinclair, but I do not know why. Other TRAP #1 codes, documented in the Quanta library, are provisionally assigned to Tony Tebby's long-running SMS-2 project. The obsolete QPTR Toolkit documentation listed a further 17 TRAP #3 routines, with codes between 108 and 127.

MTRAP takes between one and six parameters. The first parameter is mandatory and corresponds to the 'trap key' – the value of register D0 when the TRAP #1 is performed. This determines the operation performed by the trap, and is normally an integer between 0 and 35.

## Optional

Five other parameters are optional, depending on the trap key and the operation to be performed. They are passed in data registers D1, D2, D3, and address registers A0 and A1.

Many MTRAP operations deal with Qdos tasks, normally identified by a 32 bit 'task ID' in register D1. The ID consists of two integer values packed into one long word, which makes it fiddly to use from Basic.

You have the option to provide just the task number, preceded by a backslash separator. In such a case, MTRAP converts the integer parameter into a task ID before passing it on to Qdos. For instance, MTRAP 9\1 release task 1. Task numbers are displayed by common toolkit commands like JOBS and LIST\_TASKS.

I use MTRAP 9 to regain control of the system when I try to print having forgotten to connect the printer, or switch it on. At such times Qdos locks up the task that is trying to print, suspending it until the printer interface is ready.

If I turn on the printer or connect the cable at this late stage it is likely that some characters will be lost or corrupted as the connection is made. Just as it is best to turn off a hose before you re-connect it, I prefer to release the suspended task, giving a 'file I/O incomplete' message in *Quill*, and try again later when everything is set up properly.

## Taskforce

This trick works with Devpac, Psion software, and other tasks that use Qdos to talk to devices. Psion users need *Taskforce*, or some similar multi-tasker, so they can issue the MTRAP command from Basic while the offending task is stuck.

MTRAP can be useful when setting or reading Minerva's extra MODE parameters. The DIY disk includes UNRESPR, MINMODE and DISPLAY%, which tells you which screen is being displayed.

QTRAP takes between two and seven parameters. First comes a SuperBasic channel number, followed by an operation key for TRAP #3. Standard roms accept keys 0 to 73, with a few gaps.

QTRAP #C%, 14 turns on the cursor in window C%, QTRAP #C%, 17, COL% moves it across to column COL%, while QTRAP #F%, 67, OFFSET winds the file pointer on channel F% back or forth by OFFSET bytes.

There are lots more examples – including JOBLIST, EDLIN, QDOS\_VER\$, Minerva and heap routines – in DIY Toolkit Volume T, one of 16 volumes of programs, examples and text expanded from this series. The new volume assembler source for the TRAP keywords and details of all known Qdos calls.

Each volume costs £3, on our branded disks or your microdrive cartridges, plus a processing charge of £4 per order. Write to **DIY Toolkit at Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA**, or call (0559)



## Listing 3Listing 2

```

100 REMark DIY TOOLKIT TRAP KEYWORD demonstration
110 REMark BTRAP, QTRAP, MTRAP, DATAREG, ADDRREG
120 REMark Copyright Simon N Goodwin 3 May 1991
130 REMark Version 0.5, uses DIY Toolkit BPEEKs
140 REMark Tested on Minerva 1.64 and Argos 0.41
150 :
160 DEFine PROCEDURE JOBLIST
170 LET job=0
180 PRINT "SuperBasic version ";VER$
190 REPEAT show_em
200 MTRAP 2, job, 0
210 job=DATAREG(1)
220 IF job=0 : EXIT show_em
230 PRINT "Task ", job, " is at", ADDRREG!
240 PRINT !" priority ";DATAREG(3) && 255
250 END REPEAT show_em
260 END DEFine JOBLIST
270 :
280 DEFine PROCEDURE SHOW_CURSOR(ch%)
290 QTRAP #ch%, 14
300 END DEFine SHOW_CURSOR
310 :
320 DEFine PROCEDURE HIDE_CURSOR(ch%)
330 QTRAP #ch%, 15
340 END DEFine HIDE_CURSOR
350 :
360 DEFine FuNction QDOS_VER$
370 LOCAL q$(4), v, w
380 MTRAP 0
390 LET v=DATAREG(2) : q$=""
400 REMark Unwrap LONG into STRING
410 REPEAT unwrap
420 w=INT(v/256)
430 q$=CHR$(v-*(256) & q$
440 IF w=0 : EXIT unwrap
450 v=w
460 END REPEAT unwrap
470 RETURN q$
480 END DEFine QDOS_VER$
490 :
500 DEFine FuNction SYSVARS
510 MTRAP 0 : RETURN ADDRREG
520 END DEFine SYSVARS
530 :
540 DEFine PROCEDURE EDLIN
550 LOCAL buf, limit%, time%, p, result
560 REMark Edits LENGTH bytes in SuperBasic's buffer
570 REMark (which is often used by resident procedures)
580 REMark - it's wiser to use your own memory, but this
590 REMark illustrates how BTRAP and BPEEKs can co-exist
600 REMark - and use a timeout, specified in seconds.
610 buf=BPEEK_L(0)+16
620 limit%=BPEEK_L(8)-buf
630 time%=10 : PRINT #0;time%;" seconds >";
640 REMark Waits for TIME% seconds, with 50 Hz displays
650 BTRAP #0, 4, 0, limit%, time%*50, buf
660 PRINT "EDLIN:";DATAREG!
670 result=DATAREG
680 SELECT ON result
690 =0 : PRINT !"No error !"
700 =-1 : PRINT !"Not complete !"
710 =-5 : PRINT !"Buffer full !"
720 =REMAINDER : PRINT !"Unexpected !"
730 END SELECT
740 PRINT !ADDRREG-buf!"bytes used:"
750 :
760 REMark Echo buffer contents... if still there!
770 LET p=buf
780 REPEAT echo
790 PRINT CHR$(BPEEK(p));
800 p=p+1
810 IF p=ADDRREG : EXIT echo
820 END REPEAT echo
830 PRINT #0 : PRINT
840 END DEFine EDLIN
850 :
860 DEFine PROCEDURE SEEK(ch%, offset)
870 REMark Move file pointer by +/- OFFSET
880 QTRAP #ch%, 67, offset
890 END DEFine SEEK
900 :
910 DEFine FuNction FILEPTR(ch%)
920 QTRAP #ch%, 67, 0 : RETURN DATAREG(1)
930 END DEFine FILEPTR
940 :
950 DEFine PROCEDURE TAB(ch%, col%)
960 QTRAP #ch%, 17, col%
970 END DEFine
980 :
990 DEFine PROCEDURE FOUNTS(ch%, base1, base2)
1000 REMark Base =0 for the standard founts
1010 QTRAP #ch%, 37, 0, 0, -1, base1, base2
1020 END DEFine FOUNTS
1030 :
1040 DEFine PROCEDURE RELEASE(job%)
1050 MTRAP 8\job%
1060 END DEFine RELEASE
1070 :
1080 DEFine FuNction JOBSPACE
1090 REMark Finds maximum free RAM for a task
1100 MTRAP 6 : RETURN DATAREG(1)
1110 END DEFine JOBSPACE
1120 :
1130 DEFine PROCEDURE HOLD_UP(job%)
1140 REMark Suspends the job indefinitely
1150 MTRAP 8\job%, 0, -1
1160 END DEFine HOLD_UP
1170 :
1180 REMark More in DIY TOOLKIT Volume T for Traps

```

384 574, 1pm-9pm.

## Customised

Existing toolkit commands are customised for specific tasks, so they miss out some Qdos features in the interest of simplicity. Almost all channel traps allow a 'timeout', so that the program can continue, given an appropriate indication, if a device or channel remains 'busy' for a specified time.

Qdos lets you specify a timeout whenever you use a channel, but SuperBasic is not so generous. INKEY\$ is the only standard routine that lets you set a timeout. INKEY\$ (100) waits until a character is available, or two seconds (100 frames, at 50 frames per second) have passed.

It might be useful to use INPUT in a similar way, allowing the program to continue, using the text typed up to the deadline even if Enter was not pressed. This scheme is used in Di-Ren's excellent *Fleet Tactical Command*, written in machine-code. Now even Basic programmers can use timeouts in their programs.

The default timeout, -1, allows 'infinite' time. The Qdos scheduler continues to try to perform the operation until it works. Other possibilities range from 0 to 32767 frames — almost 11 minutes. Timeouts are minima; a timeout of zero means 'only do this if it can be done immediately.'

If a timeout of zero is used for display output, the action is performed at once

unless CTRL-F5 has been pressed to pause display output, in which case Qdos returns with DATAREG set to -1 (not complete). A result of zero, ERR. OK, indicates that the operation went smoothly. Thus you can write programs that do not get stuck or mess up the screen with trivia when it is paused with CTRL-F5.

BTRAP is a variant of QTRAP with special uses in SuperBasic programming. It lets you refer to the moving values inside the interpreter data area.

## Buffer

For instance, SuperBasic uses a 'Buffer' to store temporary results, INPUT lines and data being copied. The Toolkit function BPEEK\_L (0) finds the offset of the start, and BPEEK\_L (8) points past the end of the buffer. The exact address depends on the value of register A6, which points at the start of the SuperBasic area, and may change at any time.

You can find things inside Basic with DIY BPEEKs, or Turbo Toolkit equivalents, but they are liable to move as Basic runs or other tasks use memory. This is no good if you need to pass an address to QTRAP.

The SuperBasic interpreter makes much use of Qdos, so it needs to be able to use buffers inside its movable space. DIY Toolkit's BTRAP extension uses the same mechanism to address memory inside

Basic.

BTRAP works like QTRAP but the address parameter is taken relative to A6, so that you can refer to the offset inside Basic, without worrying about where the interpreter may have moved its tables when the code is executed.

BTRAPS let you save and load data held inside the SuperBasic task, like array and string details. Be careful not to overwrite other things by accident.

Display founts are not expected to move, once set, so you should select them with QTRAP rather than BTRAP. QTRAP #c%, 37, 0, 0, -1, FOUNT0, FOUNT1 does the trick, assuming C% is the SuperBasic channel number and FOUNT0 and FOUNT1 are absolute addresses.

These keywords are great for experiments, as a single command will trigger any manager or channel use trap. The functions DATAREG and ADDRREG let you check the result, error code, and values of all returned parameters.

## Flexible

The code is designed to be as flexible as possible. It will pass any value you supply — sensible or otherwise — so it should accommodate future Qdos embellishments as well as Sinclair's originals and current extensions.

The corollary is that the code can be dangerous in the wrong hands. 'Suck it and



see' programmers are at the mercy of the rom parameter checking. Inappropriate TRAPs may crash the system.

Avoid using or releasing memory that has not been allocated, and don't specify odd addresses or negative lengths for string text. Qdos assumes that such parameters are correct — as they should be, if they were correctly calculated, or returned by one of the other TRAPs.

It is often vital to check the error-code of TRAPs before assuming valid results. If an attempt to allocate memory has failed, you should not try to use the space. Often the error code indicates what a program should do next. If the cursor is already on the top line, QTRAP #0, 21 sets DATAREG to -4, signalling an 'out of range' error.

DATAREG is zero after each successful operation; otherwise it is a Qdos error code. Unless the value is zero, the operation failed and other results are not reliable.

## Access

As far as I am aware, QTRAP, MTRAP and BTRAP give complete access to the parts of Qdos previously hidden from SuperBasic. The parameters and result functions have been chosen to let you set or read all the relevant registers.

In general, TRAP #3 calls pass parameters in registers D1 and D2, with the channel ID in A0 and timeout in D3. Address parameters are passed in A1 and A2. D0 is the error code, and other results are returned in D1 and A1. TRAP #1 calls are similar, passing data in D1, D2 and D3, but there is no channel ID to worry about, so addresses uses A0 and A1.

MTRAP copies its fifth parameter to A3 as well as A0, to suit MT. IPCOM, which uniquely takes a single address parameter in A3. Other calls take two address parameters in A0 and A1, so A1 is the optional sixth parameter of MTRAP. Save your work before you call MT. IPCOM for the first time — you can easily crash the 8049, or 68008, or both, if you get the command sequence wrong.

If several results need to be returned Qdos stores them in a buffer, addressed by A1. A1 should point at an appropriate memory space, starting at an even address. For instance QTRAP 0, 11, 0, 0, -1, BASE calls SD. CHENQ, which finds the window size and cursor position in characters, and stores four words of results at BASE. MTRAP 24 allocates common heap memory.

D1 is commonly used to return a single number. A few calls set D2, and MT. JINF returns D2 and D3, so DATAREG accepts an integer parameter between 0 and 3; the default is zero.

ADDREG takes no parameters, as Qdos calls only return a single address: A0, in the case of MTRAP, or A1 for QTRAP. BTRAP returns A1 relative to A6, to suit BPEEK and its ilk.

As usual, the keyword routines are listed in two forms. **Listing two** is a quick way to enter the code without using an assembler. The first part is the same every month. Use RESPR instead of ALCHP at line 150 if you do not own Toolkit 2. Only the DATA, from line 590 onwards, changes for each DIY project.

The loader reads equivalent machine code from DATA statements, and saves the code in a file. Once you've loaded that file, as follows, you can use QTRAP, MTRAP, BTRAP, DATAREG and ADDREG in your own programs:

```
base = RESPR (378)
LBYTES "file name", base
CALL base
```

Alternatively you can load the file directly with LRESPR or LINKUP. If you have already loaded or entered the new commands on a JM or AH machine before you loaded the code, you need to type NEW to make the extensions available.

**Listing one** is the corresponding assembly code program, written and assembled using HiSoft's DevPac. Type this text into your own assembler if you want to customise the code. Note that some assemblers expect word vectors like \$110\w to be entered as \$110.W, or simply £110.

The machine-code falls into three main chunks, wrapped around by initialisation code and data. The first chunk deals with MTRAP. It fetches long word parameters with CA. GTLIN, after checking the first parameter separator in case it is a backslash.

## Bad values

If D5 is zero the second parameter is a job number. TRAP treats it as an offset in the Qdos task table, and uses it to find the full task ID. Bad values cause an 'invalid job' report.

The multiple move instruction MOVEM is the star of this listing. It is used to read several parameters from the maths stack at once, directly into data and address registers. It does no harm to pick up 'parameters' that have not been supplied. Code to count and check parameters would use up ram, complicate testing, and probably consume more processing time than it could save.

If explicit values are not supplied, registers are set to arbitrary values read from after the real parameters in memory. This does no harm, as the maths stack pointer BV. RIP is unmolested; in any case it is reset automatically when a resident procedure finishes. Unspecified registers may have any value. If the parameter value matters, supply it.

BTRAP and QTRAP share much the same code. The only difference is the TRAP #4 performed by BTRAP, immediately before the main TRAP #3. TRAP #4 sets bit 7 of the flag JB. RELA6 in the current task

header. The next TRAP #2 or TRAP #3 uses this as an indication that addresses are relative to A6, rather than absolute.

BTRAP and QTRAP report 'bad parameter' if you supply too few or too many parameters, and 'channel not open' if you get the first parameter wrong. Always check before using TRAP #4, or your code may abort leaving the flag set, causing bizarre effects when the next TRAP comes along.

The last chunk of code implements the ADDREG and DATAREG functions. Both return long integer results converted to floating-point form by the familiar RETURN\_FP normaliser.

After each successful call the register values are stored in 20 bytes of memory are REGTABLE. The data labelled DEFINE is not used once the TRAP commands are linked to the system, so I re-use their space to hold the results. If you put the code in rom you will need to move REGTABLE to ram.

## Redundant?

It might seem that DIY Toolkit is now redundant. Who needs further SuperBasic extensions, if everything is open to MTRAP, QTRAP and family?

The answer is that often special-purpose code is faster and friendlier than a sequence of TRAPs. Many programs can be written with a mix of Basic and TRAP calls, yet others — like my SET, DRAW and CLIP routines — add so much that is new that they are only practical in custom-crafted machine-code.

QTRAP and MTRAP are great when prototyping or testing new facilities and interactions, or when you want to write code that runs independently of proprietary toolkits. They shine when you need total control over errors and timeouts, or underlying routines, like FS. XINF, are not supported by commercial toolkits.

DIY Toolkit TRAP commands let you get straight at the latest versions of Qdos, without waiting for Toolkit writers to catch up.

I welcome your comments: applications for QTRAP and MTRAP that I may have missed, or ideas about extensions as yet unavailable to SuperBasic programmers. Please write to me, care of *QL World*.





# SOFTWARE FILE

## INFORMATION

**Program:** *Sector X*. 256K memory, Minerva-compatible.

**Supplier:** GCH Services, Cwm Gwen Hall, Pencader, Dyfed, Wales. SA39 9HA.

**Price:** £10.00 for 3 1/2 or 5 1/4 in disk (plus £1.00 p&p). £10.00 mdv or £12.00 two mdvs (inc. training game) plus 10% p&p.

# SECTOR X

Just another horizontal scrolling shoot-em-up game?

Here are some of the best graphics I have seen for a long time on the QL. They must be a close rival to the public arcade machines. I am impressed.

I don't profess to be an expert on this type of game so I left the main testing to the neighbour's children. They found it addictive and unanimously sung its praises.

The scene is set in one Lunar 7, where evil hordes have taken over the five planets of the Sector X solar system. To restore peace on Sector X, you have a ship with limited fire-power, and must shoot down energy balls to get extra weapons. Lastly you have to destroy the mothership and the evil Command-Eye.

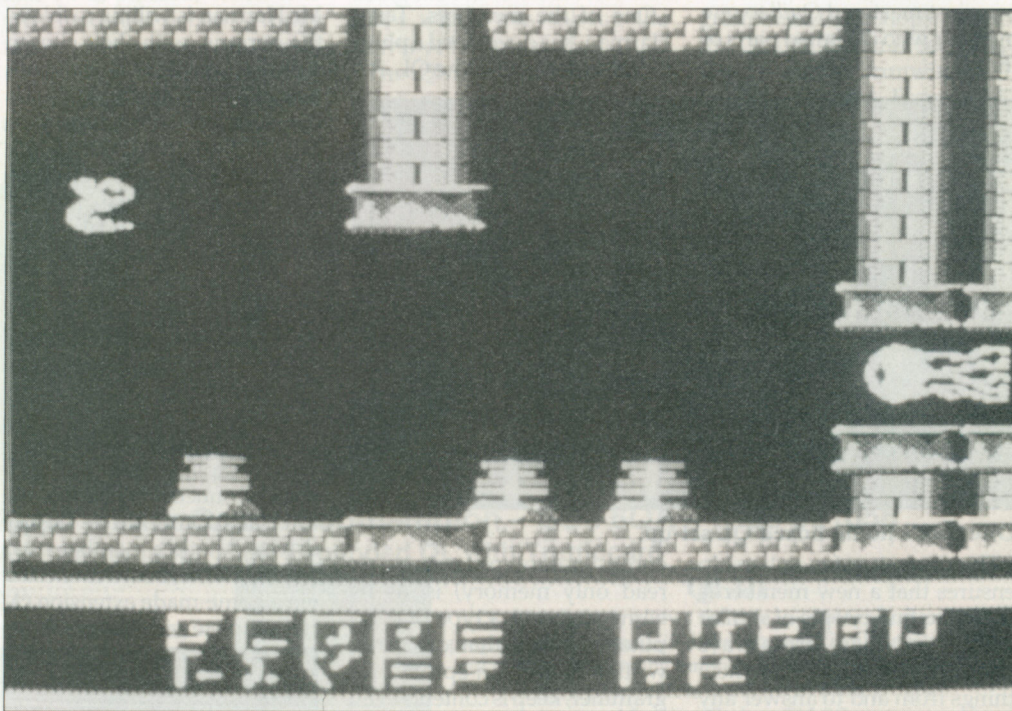
This is a fast action, reflex testing and difficult arcade game.

## Training

Fortunately the author has provided a training mode which gives you auto-immunity against most of the aliens. This enables you to go through all the scenarios enjoying the superb graphics. I think my lasting memory will be having a discussion with my friends, well into the small hours, on the best way to get past the evil spring-loaded killer eyeballs which wang out at you with unbelievable ferocity.

You will do battle with

John Shaw (and his consultancy team) venture into orbit in search of the killer eyeballs.



seemingly invincible snowflakes, manic chess pieces and massive fleas. One valuable tactic I learned is the Harrier pilots' 'up and over' manoeuvre which seems to be the only way to kill creatures which appear behind you.

This is an arcade game, which should provide many, many hours of lasting pleasure; I recommend it without reservation.



# QUANTA IN EAST ANGLIA

One area of the QL scene which has previously escaped investigation by many QL users is that of local computer clubs. Quanta, the QL User Group, has approximately twenty clubs or 'sub-groups', dotted in many places both in Britain and on the Continent, where Quanta members and non-members meet normally on a monthly basis. This is a report from the March meeting of a typical sub-group QMAS (Quanta Mid-Anglia), which holds its meetings on the second Monday evening of every month in a small church hall in Lolworth, a village just outside Cambridge.

The QMAS Club is fairly small, attracting each month about twenty-five members with varying skills, from those who have just mastered *Quill* to one member who designed parts of the QL.



One user's home-boxed QL set-up.

This diversity of membership ensures that a new member is bound to find people of similar ability and there are always people at a meeting to learn new things from and to answer any questions and solve any problems which a QL user is likely to encounter, from changing a keyboard membrane and getting a pound sign to print out, to learning a new computer language. Typical meetings are usually very busy, with many separate activities and discussions occurring simultaneously, and if the discussions go over your head, there is always the coffee and biscuits to resort to!

March's meeting was very active, with many new develop-

Local groups dedicated to the QL are flourishing. Carl Watson reports.

ments in QL software and hardware being shown for the first time.

One piece of new software, the beta-test version of Digital Precision's *Perfection*, was being shown by one of the members at the Club, and it was clear that it is a very fast word processor indeed. Using what is known as a 'lazy screen' to speed up the cursor key movement, it also has full WYSIWYG (what you see is what you get), although my first impressions suggested that it is not as powerful in this one respect at *text87*. Having said that, users who find *text87* difficult to get to grips with will probably find *Perfection* a god-send.

One of the members, Terry Harman, has developed a plug-in eeprom board for the QL. An



A discussion amongst the club members.

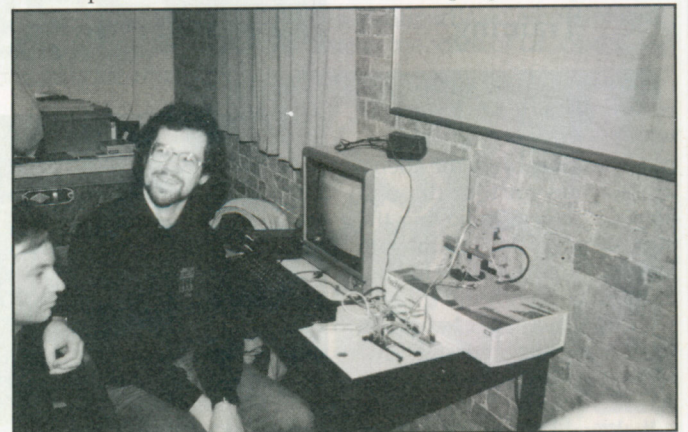
slips into the expansion port on the QL's left side. For users without an eeprom programmer, Mr Harman is willing to 'blow' the eeproms, with their chosen software on board, for them using QEP3. Unfortunately this device is not compatible with Miracle System's Trump Card, because that takes all the available memory space, leaving none for the eeprom board, but it should nevertheless prove useful to a large number of QL owners.

Home boxed QLs were much in evidence at the March meeting. One member, Steve Bourne, has gone so far as to box his QL in an IBM personal computer case, complete with IBM keyboard (connected via a suitable interface), and three floppy drives. Another member used the original keyboard connected via a home-made extension cable complete with stickers above

the microdrives to show all his *Toolkit 2* 'altkeys' and 'hotkeys', a very useful idea and one which I think I shall use myself. Yet

another has his QL in a box, interfaced to two 10-megabyte hard disks. That particular size of hard disk is too small for PCs, because their programs are much larger than the QLs, but is perfect for the QL and can be purchased quite cheaply second hand.

There is quite a lot of interest in the Mandelbrot Set and other related fractals at QMAS, with members regularly bringing along new and faster programs. One member, Carl Cronin, has developed a Mandelbrot program that, instead of plotting the Mandelbrot Set on the screen as most programs do, prints it in eight colours on a Star LC10c printer. Using this technique full size A4 page Mandelbrots, with resolutions of 960 by 792 pixels can be generated and this method certainly lends itself to producing spectacular graphics. This program is public do-



Jonathan Oakley of QView, with his robot.

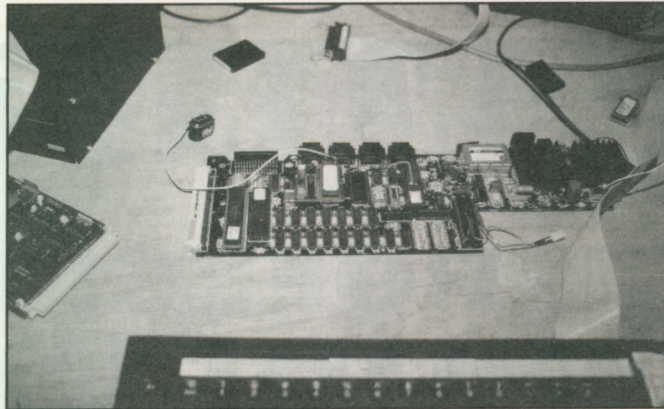


main. It is available from CGH Services and in the near future it will be in the Quanta library.

QView, the developers of *Minerva*, are members of QMAS and had an exciting new development for QL users which they demonstrated. Having persuaded many QL users to rip the top off their machine and replace the native Sinclair JS, JM or even AH Qdos operating system with their derivative of it, *Minerva*, they have now developed an eeprom board. An eeprom (electrically erasable programmable read only memory) is similar to both a ram chip and the eprom chip explained earlier. Like an eprom, an eeprom can have data stored in it, which will remain even if the power is removed, but it does not need to be blown using a special eeprom programmer; the QL can actually blow the chip itself.

**Eeprom**

The QView eeprom board, which sits in one of the rom sockets inside the QL, contains 255 bytes of eeprom and a real



The QView eeprom board, inside the QL.

time clock, and comes complete with *Minerva* version 1.88. The eeprom is used to hold the default settings for the QL, so that it remembers whether to boot into screen mode 4 or 8 when being switched on, and it knows which device to boot off. Lots of other useful pieces of information can be stored, such as a message from the user that will appear on the QL's screen before F1 is pressed, when it is switched on, or default settings for a word processor, or a password, to give some examples.

Jonathan Oakley, a member of QView and an ex-Sinclair em-

ployee, spent much of the evening demonstrating a new method he has developed of controlling robots and other similar devices from the QL. The eeprom device also has a system bus, which can be utilised, using a short piece of SuperBASIC and a small circuit, by would-be robot developers to send signals to their robot. Jonathan himself was using the bus to control an arm robot which was solving the Tower of Hanoi puzzle.

The QMAS Club itself has many resources available for loan to members, including the

complete Quanta program library consisting of over forty disks and a backup QL, for emergencies when a member's QL breaks down. The Club Chairman Peter Rowell is also thinking of purchasing, using Club funds, a ribbon re-inking machine, to allow members to re-ink their printer ribbons for as little as 50p.

**Meetings**

As I said at the beginning of this article, there are many QL clubs all round the country waiting for new members to drop in. Having been to a number of these meetings, I can say that they are very worthwhile. It is certainly worth getting in touch with the secretary of Quanta to see if there is a club near you. You don't have to be a member of Quanta to go along and I am sure that you too will find much of interest waiting for you.

For details of QUANTA sub-groups and workshops, contact the Quanta General Secretary, Ron Durrett, 38 Brunwin Road, Rayne, Braintree, Essex, CM7 5BU.

# KEN BAKER SOFTWARE

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Machine Code £20.00

**QLDL**

QL Disk Library allows the user to catalogue up to 3000 program titles (around 75 disks at a time) in alphabetical order and cross-referenced by numbers given to the disks. No more searching for endless hours for that lost program.

Machine Code £15.00

**SCREENMASTER**

Screenmaster will record anything currently on screen in a 'squeezed' form, and reproduce the picture in a variety of cinematographic-style wipes and speeds.

Machine Code £20.00

**PLANNER**

One of the most useful programs you could wish for. It will provide a printout of dates, with day and week numbers, in a month-per-page format from a given starting date and number of forward days. It also includes routines for finding day and week numbers you can use in your own programs.

Machine Code £10.00

**TRANQUIL**

Tranquil converts Quill documents into BASIC PRINT statement form in order that they can be more easily manipulated for printing and adding printer instructions etc.

Machine Code £10.00

**ALL PROGRAMS SUPPLIED ON TOP-QUALITY 3 1/2 INCH DISKS – POSTAGE & PACKING FREE**



# SOFTWARE FILE

## INFORMATION

**Program:** *Professional Publisher Toolbox*  
**Price:** £29.95 (plus 5/10% for overseas orders)  
**Supplier:** Digital Precision Ltd.,  
222 The Avenue,  
Chingford,  
London E4 9SE.  
Tel: (081)-527-5493

# PROFESSIONAL PUBLISHER TOOLBOX

**D**esktop publishing is a good area for developers of utilities. The print trade uses a vast quantity of typefaces and enhancements, shapes, pictures, colours etc., and it is unlikely any dtp program will provide the serious user with more than his/her basic requirements when it is first introduced. Digital Precision's *Professional Publisher* is by no means in its first version, having been developed from their first essay into dtp - *Desktop Publisher* - and having had a variety of improvements made since its introduction (for example, the much quicker loading process of the latest version).

## Defined

Comprehensive as ProPub is, there are several ways in which a developer can extend its range, perhaps the most obvious one being the provision of better-defined characters, particularly in large sizes. *DeLuxe Font Enlarger* (also from DP) deals with this area, but *Professional Publisher Toolbox* goes a bit further. It supplies additional QLS (standard) and HDF (high-definition) founts, and also provides tools for improving text format, importing non-DP clip art, and saving ProPub pages as screens which can be loaded into graphics programs.

The Toolbox is supplied only on disk, is for systems with at least 256 KB ram (ProPub itself needs this much), and is suitable for Thors, including the XVI. The supplied disk contained no less than 92 files - 36

■ Bryan Davies samples a new support bundle for the popular DP desktop publishing package.

QLS founts, 44 HDF founts, six screens, one page, a boot, three utility programs, and an Xtras extensions file. The boot is there solely to load the extensions file and will not be necessary if the user already has an appropriate version of DPs Xtras file (or equivalent) loaded for use with another program (eg *The Editor*, *text 87*, *Perfection*), to obtain the desired layout (text files loaded directly into ProPub may lose their paragraph splits, for instance).

The only instructions supplied with the view disk were on a single sheet of paper. The brevity of the information should not be a handicap for

experienced users; it is fairly obvious how to use the utilities once they have been EXEC-ed, and founts are simply loaded into ProPub in the normal way.

*Pretext* removes some oddities that can appear when Ascii text files are loaded into ProPub. Linefeeds are replaced by spaces, and nulls-CHR\$(0) - are then replaced by linefeeds. The effect is best illustrated by example, and the first illustration is of a text file Export-ed from *Perfection* and loaded directly into ProPub with the Configuration and Line Feed settings at WordWrap and Included, respectively. Note the 'half-lines'

and lack of paragraphs. The second illustration shows the same file loaded, with the same settings, after it had been processed by *Pretext*. The text format is now more sensible. As an incidental feature, this utility can be used on files from *The Editor* or *Perfection* before they are Imported into *Quill*, in the 'by paragraph' mode.

The *Grab Sector Clip Art* utility does what you would expect. It loads one of the Sector Software clip art files (designed to be used with *Page Designer*) to the screen and converts it into a form suitable for loading into *Professional Publisher*; that is, into a 32 KB

## An imported file, pre-Pretext.

### PERFECTION - THE NEW WORD-PROCESSING PROGRAM

Developing a word-processing program is no mean undertaking. Many people start on the task - and soon abandon it. Even a "simple" program like *Quill* required a massive programming effort. All the time you are thinking about the project, other people are beavering away, doing the same thing. Worse still, they may introduce their "baby"

before you are ready with yours, and theirs may have features you hadn't thought of, or which work better than ones you have written. Fortunately for QL programmers, there is little competition. It was unlikely that anyone else would come out with a good word-processing program whilst *Perfection* was being developed, although there was a distinct possibility that further refinements of text87 would appear (the *DeskJet* & *LaserJet* printer-drivers, for example). The problem was

more one of deciding upon what features were needed to attract existing *Quill* users, and of incorporating them into a program of acceptable size. The more features are added, the greater becomes the testing requirement, and the harder it is to find and fix problems. Although there may be no-one else writing a WP program to compete with you, there may be someone writing another program that will cause some conflict with yours. A good example is the *Minerva ROM*, which has caused hiccups for several of D.P.'s existing programs. A less-likely occurrence is the discovery of an "unknown" feature of one of the Sinclair QDOS versions; by now, most of the oddities of AH, JM, JS etc have (presumably) been discovered, but another one did show itself during beta testing of *Perfection*. Fortunately, one of the *Minerva* developers was aware of the difference between JM and JS

## The same file, post-Pretext.

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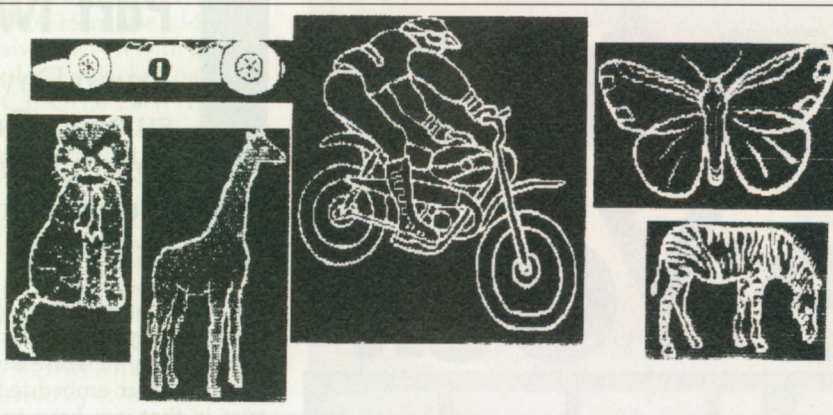
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ProPub, and is the top left-hand corner of a reproduction of the front cover of *QL World*, created directly with ProPub. The two parts of the illustration were converted separately with the Screen routine, then loaded as SBYTES pictures into ProPub, and printed from there, in a three-pass print of the resulting page on a nine-pin printer. This routine, also, ends one conversion operation with the message 'Done.', and you appear to have to restart the routine to convert another file; likewise, you need to do a directory beforehand, to know what file name you need for input.

Some Sector clip art grabbed and imported.



SBYTES file. The conversion is done quickly, with the on-screen prompts being sufficient explanation of what to do. The routine is less than helpful when the first conversion has been completed - it simply writes 'Done.' to the screen, and leaves the user with

no cursor, and no suggestions as to what to do next. Pressing ENTER achieves nothing apparent, and it seems necessary to return to SuperBasic and restart the routine. It is also necessary to do a separate SB directory of the input device, and list the required files

manually, since there is no directory function built-into the Grab routine itself. Not very helpful if you want to convert a few dozen files. The third illustration shows some Sector clip art, converted by Grab and loaded onto a ProPub page.

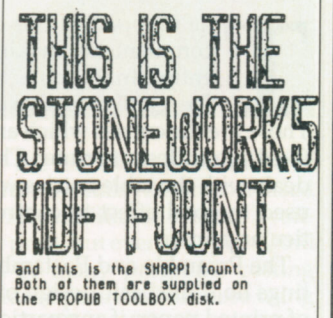
Illustrations combined from two sources.



The Screen From Page routine will take part of an existing Professional Publisher page and save it as a screen (picture), in the form of a 32 KB SBYTES file. This allows that part of the screen to be loaded into a graphics program and modified; it can subsequently be reloaded into ProPub. The routine does not itself allow selection of part of a page - that has to be done in ProPub, by identifying the page section required there and saving it as a part-page.

Surplus

Alternatively, you can use the whole page, and allow the routine to deal with just the top, left part of it, assuming what you want is contained within that area. Any surplus material can be removed later, using a graphics program or ProPub. The Screen routine converts all of the chosen area into a 32 KB screen file. It doesn't care whether the page section concerned is graphics or text. The fourth illustration is of a combination of parts of two ProPub pages. The top section (the portrait) comes from one of Digital Precision's sample page files, and is actually a drawing done with the graphics program Eye-Q and imported into ProPub. The bottom section comes from a page created during the course of writing an article on using



Two font samples

There are too many additional founts on the Toolbox disk to do more than show a couple of samples here. A total of 36 QLS and 44 HDF (high-definition) founts are supplied; two of the latter are shown in the fifth illustration. The space taken by these founts varies quite a bit, and the user may have to remove several of the default founts to get certain new ones in. For example, the STONERWORKS\_HDF fount is in a file of 16 KB, which is much larger than most of the other founts.

The three routines, and the founts, on the disk do their job well. They are all useful accessories for the Professional Publisher user. The less-experienced user would welcome more written advice on how to make use of the functions, or integration of the routines with ProPub itself, but it is fairly usual with such add-ons for them to be rather spartan in this respect. The results speak for themselves, as shown in the illustrations here. The user gains significant flexibility, without losing much time, and the cost is modest.



# Learn to Love Your PRINTER

## Part Two

Bryan Davies surveys Quill commands to get the best from your printer.

**T**he first part of this article gave comments on making the basic entries in the table displayed by the *Quill* `Install_bas` program. Those are the entries which are relatively fixed, regardless of printer. This final part deals with the table entries which can be used to good effect to control *your* particular printer.

The Preamble and Postamble code settings hold the basic design of your sheet of printed paper; if any particular printer feature is going to be needed throughout printing, it should be called in the Preamble. For example, if you normally print in 12-pitch, switch that feature on with the Preamble. This doesn't stop you changing to any other pitch within a document, but you know that the printer will always start in 12-pitch mode. Likewise, if you normally use the USA standard character set, switch it on with the Preamble. The Postamble enables you to switch the printer back to some basic setting, when a print run has finished. You then know what it is going to be set to do when you next use it (assuming it has not been switched off); this is essential if you print from different sources – for example, *Quill* and *SuperBasic* – during one session, as it avoids the messy effect that the different source formats can produce. For example, if you end up a *Quill* document with condensed print, and then go on to list a *SB* program, the printer is not to know you don't still want condensed print, if you don't tell it so.

### Entering Codes

All the entries from Preamble on down require a particular form of presentation, to meet the requirements of `Install_bas`. You have a choice of four ways of entering the character codes, but it may be that neither of these ways is exactly the same as that in which the codes are set out in your printer manual. Nevertheless, you must use the *Quill* way.

Codes have to be entered singly, separated by commas, with a maximum of 10 codes per entry. It is acceptable to mix the code types on a line. The types are: Ascii mnemonics, such as ESC, NUL, SOH; hexadecimal codes between \$0 and \$FF; decimal codes between 0 and 225; single characters preceded by a single or double quote mark, eg "I, '1, "4. For example, my printer manual states that the coding for setting *Elite* typestyle (12-pitch) is ESC "M", <1B>H<4D>H, or <27>10<77>10; this can be entered as ESC."M, or 27,77, or 1B,4D, or ESC,77, or 27,4D, or any other similar combination.

Returning to the Preamble sequence, it can be used to switch on alternative/extra character sets (you may want Greek, Spanish or other language symbols), margins, tab intervals etc.

The Postamble may not be needed, but a typical sequence is ESC,"@ to return the printer to the same settings as when it is first switched on. The Bold, Underline, Subscript and Superscript on/off entries are for the embedded *Quill* typestyle functions – those you can obtain using the F4 key. The entries are the codes your printer expects to see for the corresponding functions, such as ESC,"G for double-strike printing, which is a form of Bold print.

Check the descriptions of function actions carefully before using them; some functions do not work with others, a typical case being that emphasized print (another form of Bold) may not work with the *Elite* character size. Subscript and Superscript are functions which many users will never use and they can be converted to other functions. There is nothing to stop you inserting the printer codes for, say, italic print into the Subscript entry; then, whenever you use F4 L, you will get italic print. The screen presentation will still be the stylised, raised characters, however.

Many printers have more useful functions than the *Quill* printer driver can

command, and adding another two possibilities may be sufficient to solve a dilemma. The 10 Translate entries differ from the four embedded command entries in that you have to insert both the codes for the command keying and those for the corresponding printer function. This means that you have a maximum of nine codes left to describe to the printer what is required when one key is hit.

There may be more than one way of getting a particular printer function, and it can be necessary to look for the shortest coding. The first code is the one produced by the keyboard, and it must be in the range decimal 32 to 255. This limits you to using keyings that produce characters on the screen, which is desirable in that you have some indication of changes in print form.

If, like me, you want to keep keypresses to a minimum, you have to look at the keyboard and decide which characters shown there are not likely to be used within text; ~, @, ; are examples which can be produced using two keys, and you may be able to do without one-key characters such as \, [, ]. There is a wider choice if you accept three keys per character. All possibilities are listed in the 'character set and keys' section of the *QL User Guide*, and it is from there that you can get the corresponding codes to enter into the printer driver.

### Sample table

A sample printer driver table is given here, for guidance only. The printer concerned is 'Epson-compatible', but that doesn't mean the codes are just the same as on an Epson. Look at this table for ideas on how to tackle producing your own particular requirements. Note that the Translates can be used both to switch on printer functions and to convert character codes from those used by the keyboard to those required by the printer for the same characters. The obvious example of the latter is the £ sign, so often printed out as something else. The *QL* keyboard code for this character is decimal 96; the same code produces a single quotation mark on the *Kaga* printer, with either the USA or the UK character set. To be able to print the # character, the USA set can be used; to get the £ as well (without using the code 35 needed for the #), an additional character set has to be activated.

The code 6 in the additional set on the



Kaga produces the £, so the Translate entry is simply 96,6. Here, the additional character set is switched on with the Preamble, but it could be switched on by the Translate 96,ESC,I,SOH,6. Each Translate entry can be used to produce only one printed character; it doesn't matter how many codes (up to nine) are used to specify that character, however. This is used in producing the Ø character; CTRL-SHIFT-R puts it onto the screen, and to get it printed the Danish character set is invoked (for this one character only).

The Translate entry is 178,27,82,4,92,27,82,0 which is the QL code for Ø (178), followed by switching on the Danish set, followed by the Kaga code \ (92), then switching off the Danish set.

There are some points to remember when calling up timesteps. If you want to use several pitches, and features like proportional spacing, you have to ensure that switching off a feature returns the printer to a suitable state for what it has to do next. NLQ print is 10-pitch and, if your basic timestep is 12-pitch, you have to switch off NLQ by telling the printer to switch to 12-pitch. The same applies to enlarged (and enlarged-condensed) Pica.

In the sample driver, the Preamble sets 12-pitch as the basic style (ESC,"M). NLQ is called by the ^ character (code 94), and switched off by calling Elite (12-pitch) again, hence Translate 2 reads ^,ESC,(ESC,p,SOH. Note here that you cannot type in ^ when entering this line - Quill wants the code itself. ESC,p,SOH is one way of specifying 12-pitch, and ESC,"M works just as well. Proportional spacing may work only with 10-pitch, and has to be switched off deliberately when 12-pitch is returned to.

One easy trap to fall into is the one set by the printer makers when using three or more codes for a function. The third code may be shown as simply n, and it might be less than obvious what form this has to take - decimal, straight numeric, etc. Where NUL or SOH appear in the sample driver, you have examples of n being set to 0 or 1. The actual entry typed in to produce the screen entry ESC,R,NUL was 27,82,0. On the other hand, the ESC,"!" + n function has a list of 64 timesteps (on the Kaga) and they cannot be entered by using the numbers 0-63 as Ascii codes (that is after a quotation mark); to set bold, enlarged-condensed Pica, you can enter ESC,"!,"4, or 27,33,52 etc. 52 is the listed decimal number, 4 is the equivalent Ascii character (that appears on the screen when you hit the 4 key).

The decimal number is arrived at by looking at a table of (computer) bit settings, and selecting the features required; in this case enlarged print requires the fifth bit to be set 'on', double-strike (bold) requires the fourth bit to be on, condensed requires the second bit to be on. This means that the decimal code (the sum of the bit settings) is  $1 \times 2^5 + 1 \times 2^4 + 1 \times 2^2 = 52$ . The combination of enlarged and con-



densed Pica give 8.55 characters/inch, a useful medium-size print for headings.

The purpose of Translate 7 may not be obvious. In order to maximize the available Translate entries, this one setting is used to switch off any or all of the others. By doing this, you don't have to use two entries for each function, one each to switch it on and off. Translate 7 sets the print style back to Elite (12-pitch), turns proportional spacing off, and turns italics off.

### Turn off and on

Using this approach, you have to remember that the 'off' keying will turn off features you may want to continue using, and it may be necessary to turn them back on immediately afterwards. If you have chosen to have both condensed and italics on, together, then to switch off only the italics, the 'off' switch puts both italics and condensed out of action, and you have to reset condensed. This situation should not occur frequently, and the need to reset a feature occasionally is a small price to pay for the ability to have several more Translate entries available, and for not having to remember a variety of different keys for switching features off. Of course, however you look at it, having to use 'odd' symbols and key combinations to select printer features is far from being the ideal way of making the features easy to use, but we have to live within the constraints imposed upon us by the software and hardware designers. I much prefer to use mnemonic keying, but that really isn't feasible with the basic Quill; when dealing with *The Editor* later, I will explain how more-recognisable key combinations can be set up to call the features.

It is surprising that, when Quill was re-

written for use on PCs, the number of embedded feature-calls was not increased much; the only additional feature available is italic print, but even that puts Quill well ahead of many programs costing several hundred pounds. For those using both a PC and a QL - maybe the former in the office, and the latter at home - it is quite straightforward to set the respective printer drivers up to use essentially the same key combinations on both machines, with only minor variations to allow for the different way italics have to be called and for keyboard variations.

A sample printer driver for Kaga-Taxan KP-810 (Canon PW1080A) printer follows. The basic setting, from the Preamble entry, is Elite (12-pitch) type on, Printable Control Code range on, Printable Range Expansion on. The embedded Quill features F4 B/U/H/L are set to give those features - Bold/Underlined/Superscript/Subscript. The Translate entries 1-10 call these features:

- (1) proportional Pica (10-pitch; proportional spacing is always bold),
- (2) proportional nlq (bold and 10-pitch),
- (3) enlarged, proportional Pica (bold, 5-pitch),
- (4) condensed Pica (17.14-pitch),
- (5) enlarged-condensed bold Pica (8.55-pitch),
- (6) enlarged, bold Elite (6-pitch),
- (7) italics and proportional spacing off, Elite on ('everything off'),
- (8) convert keyboard £ to printer £,
- (9) italics on,
- (10) convert keyboard Ø to printer Ø.

In a few cases, combinations of calling codes may not produce the desired result unless they are in a certain order; in the examples given here, it is necessary to key



# LEARN TO LOVE YOUR PRINTER

## Screen display:

NAME	KP-810
PORT	SER1
BAUD RATE	9600
PARITY	NONE
LINES/PAGE	70
CHARACTERS/LINE	134
CONTINUOUS FORMS	NO
END OF LINE CODE	CR,LF
PREAMBLE CODE	ESC,M,ESC,I,SOH,ESC,6
POSTAMBLE CODE	ESC,@
BOLD ON	ESC,G
BOLD OFF	ESC,H
UNDERLINE ON	ESC,-,SOH
UNDERLINE OFF	ESC,-,NUL
SUBSCRIPT ON	ESC,S,SOH
SUBSCRIPT OFF	ESC,T
SUPERSCRIP ON	ESC,S,NUL
SUPERSCRIP OFF	ESC,T
TRANSLATE 1	@,ESC,!,NUL,ESC,p,SOH
TRANSLATE 2	^,ESC,(,ESC,p,SOH
TRANSLATE 3	,ESC,!,0,ESC,p,SOH
TRANSLATE 4	{,ESC,!,EOT
TRANSLATE 5	},ESC,!,4
TRANSLATE 6	~,ESC,!,1
TRANSLATE 7	©,ESC,5,ESC,!,SOH, ESC,p,NUL
TRANSLATE 8	£,ACK
TRANSLATE 9	\,ESC,4
TRANSLATE 10	Ø,ESC,R,EOT,\,ESC,R, NUL

## Comments/decimal code keying:

(10 characters maximum)
(only alternative is SER2)
(or 75/300/600/1200/ 2400/4800)
(or SPACE/MARK/ODD/ EVEN)
(0 to 255)
(0 to 255)
(or YES)
27,77,27,73,1,27,54
27,64
27,71
27,72
27,45,1
27,45,0
27,83,1
27,84
27,83,0
27,84
64,27,33,0,27,112,1
94,27,40,27,112,1
124,27,33,48,27,112,1
123,27,33,4
125,27,33,52
126,27,33,49
127,27,53,27,33,1,27,112,0
96,6
92,27,52
178,27,82,4,92,27,82,0

switching command. These combinations have to be entered as CTRL-SHIFT-alpha. If you don't like doing this, try choosing another mnemonic for the feature concerned; use CTRL-S ('small') for condensed print, rather than CTRL-SHIFT-C, for example.

## Choice of method

The sample Driver\_dat file has much the same features in it as the sample Quill Printer\_dat file, as would be expected since the aim is to get the same printed output. Like Install\_bas, you can enter the codes in various ways, your choice of method being influenced by personal familiarity with code systems as well as the presentation in the printer manual. I find decimal the least complex; the only difference from Quill here is that the # prefix has to be used with all decimal codes.

The separating comma between codes is mandatory, as before.

All lines giving instructions to the print program (Edtprt\_bin) must start with a semi-colon; lines which are for information purposes only – equivalent to SuperBasic REMark lines – must start with a period/full stop.

There are no serious restrictions on how many instructions are passed to the printer, and the sample includes a set of code-changes for printing out characters from other European languages. If you check the keyboard codes given for such characters in the QL User Guide list against the characters produced on the screen, you may notice they do not all agree, and some experimentation may be required. The entries are all PXL (affecting one line only) because they are to take effect only at the point the code is met in the text. This avoids strange hangover effects in subsequent printing. The entries for typestyle changes are all PXC (global) in effect. They can be compared directly with those in the sample Printer\_dat file. One slight difference between Quill and The Editor is that combining a Quill embedded command with a Translate command does not always produce the desired result, whereas all the Editor commands are of the Translate form and can be combined as required. The Bold feature was incorporated into other feature calls in Printer\_dat, as using F4-B with, say, } for medium bold Pica does not seem to work.

## Headers and footers

The margins for page headers and footers (PHM and PFM) are set to give a total of 70 lines when added to the text length, PPL. You can re-specify these parameters on individual pages of a document, but don't change just one without making a balancing change to one or both of the others. That is, the basic text length of 60 lines could be changed to, say, 63, to accommodate one page where it is essential to get certain text onto that page rather than the next one, but

:^, rather than ^:, to get enlarged proportional nlq.

Reverting back to the point about non-printing codes spoiling the line justification, one way of partially fixing the problem is to insert a space (or two) into the Translate entries concerned. Take italics in the sample above; as it stands, putting the character \ into a document will cause the printer to use italic type, and to shorten the line it is on by one space for every occurrence of the \. If the code conversion for switching off all codes is changed to 127,27,53,27,33,1,27,112,0,32, a space will be 'printed' each time any of the typestyle codes is switched off. The print begins to look rather strange if you insert more than one space each time, however, so that it is not feasible to balance out all codes.

## Flexibility

To Create a Driver\_dat file for The Editor, the process is essentially similar to that with Printer\_dat in Quill, but there is much more flexibility to choose what you want to do with the printer. The greater range of possibilities offered does entail doing more thinking, if you are to really use the features, but you can make a minimal file without great effort. It is helpful to have gone through all the agonies with Quill beforehand – not that this will necessarily

prevent you making the same boobs! The file can be created in The Editor itself, and there is a sample file to give guidance. The manual goes into much more detail than the QL User Guide, and the comment here is on only those points where I had trouble.

It is possible to make the keying compatible with that used in Quill, but it is likely you will end up not doing this, for various reasons. Now you have the opportunity to use control codes which do not involve 'losing' normal keyboard characters, you may choose to do so. Being able to call more printer features means finding more key combinations, and most people won't be able to spare any more of the normal set. The chance to use mnemonic representations of the printer features is not to be missed. The Editor has its own fount of characters, produced by pressing CTRL before alpha keys; the screen character is the normal alpha one, with a bar over the top (overscore or overline). CTRL-B produces B on the screen; you can find the corresponding decimal or hexadecimal code in the character set and keys list in the QL User Guide.

For most purposes, then, you need only two keys for any printer feature to be called. Unfortunately, some combinations of CTRL and alpha have operating system definitions, and cannot be used. An obvious example is CTRL-C, which is the task-





there would have to be a corresponding reduction of 3 in PHM or PFM, or split between the two of them. PHM is best left at 2, or 1 at the minimum, to allow the printer time to get the paper moving precisely, before it prints the first few lines of text.

**Sample Driver\_dat file for Kaga-Taxan KP-810 (Canon PW1080a) printer**  
 .18 May 88:Driver\_dat  
 ;Name KP-810

```
;PDV ser1
;PBD 9600
;PPA #27,#54,#27,#77,#27,#73,#1
;PPO #27,#64
;PHM 2
;PFM 8
;PPL 60
;PLM 8
;PEL #10
;PSS
;PXL £:#96;#6
;PXL Ø:#178;#27,#82,#4,#92,#27,#82,#0
;PXL ä:#128;#27,#82,#2,#123,#27,#82,#0
;PXL ö:#132;#27,#82,#2,#124,#27,#82,#0
;PXL ü:#135;#27,#82,#2,#125,#27,#82,#0
;PXL Å:#160;#27,#82,#2,#91,#27,#82,#0
;PXL Ö:#164;#27,#82,#2,#92,#27,#82,#0
;PXL Ü:#167;#27,#82,#2,#93,#27,#82,#0
;PXL ß:#156;#27,#82,#2,#126,#27,#82,#0
;PXL è:#144;#27,#82,#1,#125,#27,#82,#0
;PXL é:#131;#27,#82,#1,#123,#27,#82,#0
;PXL à:#141;#27,#82,#1,#64,#27,#82,#0
;PXL ç:#136;#27,#82,#1,#92,#27,#82,#0
;PXL ù:#154;#27,#82,#1,#124,#27,#82,#0
;PXL °:#186;#27,#82,#1,#91,#27,#82,#0
;PXL §:#182;#27,#82,#1,#93,#27,#82,#0
;PXL Pt:#157;#27,#82,#7,#35,#27,#82,#0
;PXL ¡:#179;#27,#82,#7,#91,#27,#82,#0
;PXL Ñ:#181;#27,#82,#7,#92,#27,#82,#0
;PXL ¿:#180;#27,#82,#7,#93,#27,#82,#0
```

```
;PXL ñ:#137;#27,#82,#7,#124,#27,#82,#0
;PXG Double Strike;#2;#27,#71
;PXG Underline;#21;#27,#45,#1
;PXG Superscript;#8;#27,#83,#0
;PXG Subscript;#11;#27,#83,#1
;PXG Proportional NLQ;#14;#27,#40,
#27,#112,#1
;PXG Double Strike Proportional Enlarged
Pica;#7;#27,#33,#48,#27,#112,#1
;PXG Double Strike Enlarged Elite;#5;
#27,#33,#49
;PXG Condensed Pica;#19;#27,#33,#4
;PXG Medium Pica;#13;#27,#33,#36
;PXG Proportional Pica;#16;#27,#33,#0,
#27,#112,#1
;PXG Italics;#20;#27,#52
;PXG All off;#15;#27,#53,#27,#33,#1,#27,
#84,#27,#45,#0,#27,#72,#27,#112,#0
```

The keyings mostly have some mnemonic content - CTRL-B for B, CTRL-S for small (condensed), CTRL-H for high (superscript). CTRL-I is used to indicate the end of a page, so is unavailable for low (subscript); CTRL-K has been used, as being the nearest, alphabetically, to H (for high). To distinguish between the two enlarged types, CTRL-G has been used for Pica (giant - because it is the largest available) and CTRL-E for Elite (enlarged). CTRL-M suits medium (enlarged-condensed). CTRL-I is a system code, so CTRL-T has been used for i**Talics**. Hopefully, suggesting such key combinations will have the effect of goading users into generating their own, better ones!

Several methods of introducing code translations have been suggested by readers over the past year, and some of them may suit individual users better than the method given in Part 1 of this article. For instance, the ESC code needed as a preliminary to get a printer to change most

features can be entered into a document by typing CTRL-;, which appears on the screen as û. To make the keying clear - hold down the CTRL key and tap the ; key. These are the keys which produce the decimal code 155. The printer converts this code to the one for ESC. So, when you want italics, type û"4" into your text (your printer may require the second code in a somewhat-different format). My own feeling is that the method described in this article is more appropriate for users who want the selection of features to be as automatic as possible, but the method just mentioned may be preferable for users with more knowledge of the mechanism of getting printed output.

## Easy and difficult

There are two other programs to consider when talking of printer drivers. *text<sup>87</sup>* makes life both easy and difficult. As an ordinary user, there is nothing you can do to alter the supplied drivers, and that makes life much easier than it is with Quill or The Editor. Should you have a real need to change a supplied driver, you would have to either ask the suppliers of the program to write it for you, or ask for the assembly code of the driver and make the changes to that yourself. For a user with sufficient programming knowledge, and having a suitable assembler program, making changes this way is straightforward. The other program is due on the scene any day now, at the time of writing - Perfection. The printer driver for this can be tailored by the ordinary user, but comments on doing this will have to wait until the print selection of the program has been finalised, and I've had time to work with it.

## INFORMATION

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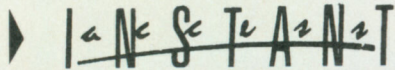
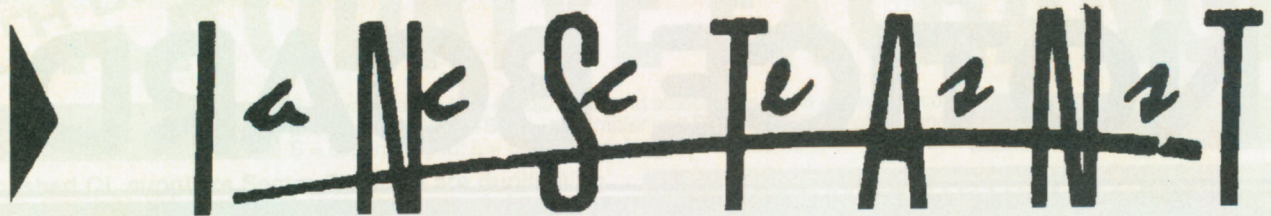


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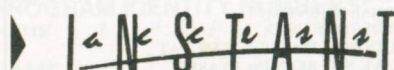
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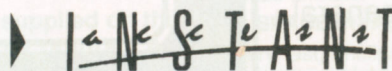
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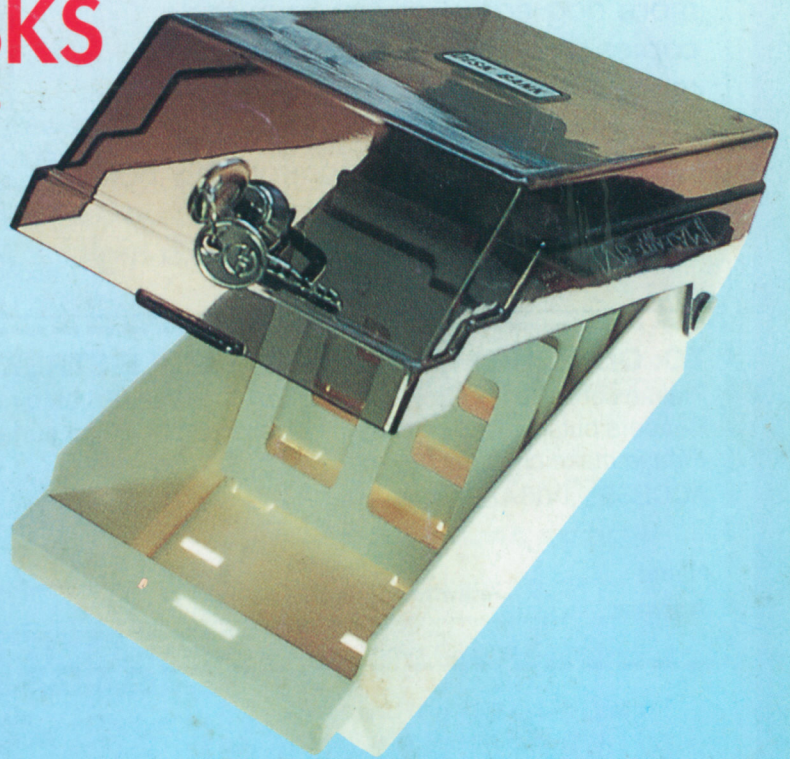
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